

# THE IRON AGE

ESTABLISHED 1855

New York, May 24, 1928

VOL. 121, No. 21

## Bonus System for Foremen

Controllable Burden and Labor Expenditures Feature  
Information Given to Minor Executives of  
A. O. Smith Corporation

BY ROGERS A. FISKE\*

**S**PECIAL information in respect to both the cost and economy of plant operation, combined with the policy of taking each foreman into its confidence in so far as controllable burden and labor expenditures in his department are concerned, are features of a foremen's bonus system used by the A. O. Smith Corporation, Milwaukee. Results obtained are high-grade workmanship, low-cost production and a broadened viewpoint on the part of the foreman, which makes him fill his present position in a more satisfactory manner than otherwise and develops his natural ability so that he will be prepared for further advancement as opportunities occur.

This system has now been in operation for several years. It has served its purpose as an incentive to high-grade work on the part of those men who have been entrusted with the responsibilities of minor executive positions. It is at once apparent that the aim of this bonus system is to secure the best possible results for the company and at the same time to reward, in direct proportion to the good results from these efforts, those who are active in that accomplishment.

In this plant, as in most others, men who step up into positions of foremanship, or assistant foremanship, are practical men from the ranks. They are good workmen with a natural ability to control and direct the efforts of others. Previous to the time of their promotion, however, they have not had, in most cases, any training in the matter of operating costs economies, and as a result do not have a keen realization of just what the expenditures in a department amount to, aside, possibly, from those involved directly in production.

To these men the details of operation as presented under the bonus system come as something new and

*THE blanks reproduced on the next two pages indicate how a foreman's monthly bonus is calculated. They cover the cases of both so-called productive and non-productive departments.*

*With a perfect record, the bonus amounts to 30 per cent of the foreman's salary for the month. One-fifth of the bonus, or 6 per cent on the salary, covers performance for which he alone is held responsible. The remainder, or 24 points, is an allotment measuring the perfect performance of his department. The percentage of these 24 points that the foreman realizes is equal to the percentages his department reaches of the standards set for its production schedules, its standard of controllable burden expenditures, etc.*

something interesting. They soon learn that burden is an active factor in the matter of the cost of production, and that it is impossible to manufacture without it. The problem of trimming this burden to the minimum and holding it there becomes of special interest to the man when he shares in the savings.

It is the policy of the A. O. Smith Corporation to take its foremen into its confidence in the matter of controllable burden and labor expenditures. The company does not confine itself to presenting a list of these expenditures after the bonus has been figured, but actually furnishes, day by day, a statement of these expenditures,

so that the foreman may be in a position to head off unsatisfactory conditions as soon as they appear. The company records are so kept that additional information desired by a foreman along special lines in which he may be interested can be had on short notice.

The company does not in any way stress to the foreman the matter of non-controllable expenses, but as a matter of general education does give him some idea of what they are and what they amount to. He is also given an approximate idea of the value of the equipment under his control. In short, each foreman is put in the position of a well-posted executive, as far as his own work is concerned, and is made a participant in the benefits accruing from his efficient management.

The maximum, or 100 per cent monthly bonus earnings of a foreman, amount to 30 per cent of his regular monthly salary. Eighty per cent of the bonus is based on finding of fact, while 20 per cent is reserved for arbitrary rating. The policy has been adopted that this arbitrary rating shall belong fully to the foreman, unless there shall have been some particularly glaring shortcoming on his part, in which case deductions may

\*Western editor THE IRON AGE, Chicago.

Sheet 1

FOREMEN'S MONTHLY BONUS							
Dept.	No.	Month of		May		1928.	
DIVISIONS OF BONUS MARKINGS	Bonus Limits		Variable Allowed Diff. 1-2	Actual Per. Attained	Diff. Int. Cts. Max. Diff. 1-4	Eff. Attained \$ 3	Max Bonus Allow.
	Max.	Min.					
Burden - Relation to Productive Labor	175	125	50	(c) 140	35	70	40
Productive Labor - Furtion on P. Wk	95	100	5	(f) 98	3	60	20
Schedule - Portion Accomplished	92	100	8	(m) 97	5	62.5	20
Personal Rating (see "n")							28
TOTAL PCT. EARNED OF MAXIMUM ALLOWED BONUS							69.5

BASIS OF ABOVE CALCULATIONS	
(a) Productive Dollars of Dept. for Month	112,500.00
(b) Total Controllable Burden (See sheet 2)	17,500.00
(c) Per cent Controllable Burden of Productive Labor (b ÷ a)	140%
(d) Productive Hours of Dept. for Month	17,857
(e) Productive Hours paid on Piece Work Basis	17,500
(f) Per cent productive Labor on Piece Work (e ÷ d)	98%
(g) Total Jobs Scheduled	500
(h) Jobs Completed to Schedule	480
(i) Per cent Jobs completed to Schedule (h ÷ g)	96%
(j) Total hours Scheduled	17,700
(k) Hours completed to Schedule	17,346
(l) Per cent Hours completed to Schedule (k ÷ j)	98%
(m) Average per cent of Jobs and Hours completed ((i & l) ÷ 2)	97%
(n) Personal Rating Deductions - Violation of fire regulations - pipes blocked May 19th.	3

(Sheet 2)

DETAIL OF CONTROLLABLE BURDEN			
DEPT.	No.	MONTH OF	May 1928.
CONTROLLABLE BURDEN ITEMS		BURDEN FOR PRESENT MONTH	BURDEN PER \$100 PROD. LABOR
			PRESENT MONTH PAST MONTH
S-1 Idle Time		50 00	40
S-3 Premiums Allowed		45 00	36
S-64 Overtime Allowance		210 00	1 68
S-7 Foremen and Assistants		1 700 00	13 60
S-8 Storekeepers		500 00	4 00
S-10 Janitors and Sweepers		360 00	2 88
S-12 Shop Oilers		56 00	45
S-13 Hand Truckers		245 00	1 96
S-14 Elec. Tr. and Tract Oper.		910 00	6 48
S-18 Inspection of Product		1 850 00	14 80
S-21 Cleaning Mach. and Equip.		35 00	28
S-24 Moving		9 00	07
S-33 Loco. and Gnt. Cr. Oper.		600 00	4 80
S-34 Electric Crane Oper.		10 00	08
S-38 Inefficient Labor		450 00	3 60
S-46 Clerks and Messengers		780 00	6 24
S-39 Repairs to Product		600 00	4 80
D-52 Tool Crib Attendants (Diarr.)		800 00	6 40
S-45 Setups		50 00	40
S-25 Maintenance Elec. Lights		25 00	20
S-26 " Estate		25 00	20
S-27 " D. J. and Fix.		2 700 00	21 60
S-28 " Equipment		400 00	3 20
S-29 " Machinery		500 00	4 00
S-30 " Perm. Tools		50 00	40
D-13 Maintenance of Cranes		150 00	1 20
D-20 " of Vess. and El. Trks.		200 00	1 60
S-72 Spoilage		600 00	4 80
S-76 Errors		15 00	12
S-23 Small Perish. Tools		1 200 00	9 60
S-52 S. X. Shop Supplies		425 00	3 40
Fuel Oil		210 00	1 68
Water		80 00	64
Gas		-	-
Parking		-	-
S-5 Steam Power		-	-
D-35 Steam Heating		450 00	3 60
Electric Power		1 275 00	10 20
Charges for Accidents		60 00	48
TOTAL BURDEN		17 500 00	140 00
			139 74

be made up to the extent of the full 20 points.

In the productive departments of this corporation the work is of a highly repetitive nature and is paid for almost wholly on a piece work schedule. This situation is ideal for establishing bonus earnings based on fact finding in three clean-cut divisions; namely, the operation of the productive work wholly on a piece work basis; accomplishment of the schedule as laid down by the production department, and maintenance of controllable burden expenditures at the practicable minimum.

The forms, D-202, sheets 1 and 2, shown on this page, indicate the details of the bonus of a regular productive department. The details of the controllable burden, as shown in Fig. 2, are merely a summary of the departmental expenditures for the month, with an extended column figured to a cost per \$100 of productive labor, which is equivalent to a percentage rating. Against this last column is also shown the rating of the preceding month. In the upper form, on this page, under "Basis of Above Calculation" this burden is shown to be equal to 140 per cent of the productive labor. This figure is then entered in column 4, "Burden Relation to Productive Labor" and the calculations made as indicated, resulting, as shown in column 8, with 28 points earned out of a possible 40.

By items *d* and *f*, under "Basis of Above Calculations," is shown the method of calculating the relation of piece work to total productive work. The 98 per cent shown as the mark attained here is then entered on the schedule at the top of the sheet, and it results, after the indicated calculations have been made, in a 12-point bonus earning under column 8.

In like manner items *g* through *m* indicate the method by which the accomplishment of the department against its schedule is measured. It will be noted that this work is rated on a double basis, that is, by hours and by jobs. This is done so that the department head will be tempted to pile

**THE** forms shown on this page are used when computing foremen's monthly bonus in production departments. Total points earned under column 8 (upper form) represent the per cent earned of the maximum possible bonus.

The lower form gives the detail of the controllable burden as tabulated both in productive and non-productive departments.

up credits neither solely in the matter of hours, by running all long jobs, nor in the matter of jobs by running all short jobs. This rating is then carried to the schedule at the top of the page and necessary calculations made.

Item *n* indicates that the foreman has been lax in the enforcement of fire regulations, and is therefore penalized 3 points of his possible 20 personal marks.

The sum of his points earned, as shown in column 8, amounts to 69.5 per cent. If this foreman received a salary of \$300 per month, his maximum possible bonus would be 30 per cent of that amount, or \$90. His bonus rating for the month would entitle him to receive 69.5 per cent of \$90, or \$62.55.

Calculations for the non-productive departments are made as indicated on forms D-200 and D-201, shown on this page. In the upper form under *a*, is entered the amount paid in this department for service to the plant plus the amount expended in the department for any items of expense which may be within the control of the foreman. Service of an unusual nature, and work on items of capital investment, are not included in this calculation.

The lower form is used where a department carries a fair-sized overhead in connection with the particular line of service rendered. In the top line is figured the departmental standing on the basis of the amount of service or maintenance labor performed as against the productive labor of the departments served. In the second line is noted the standing attained by the department in the matter of its controllable burden to its particular productive labor.

The maximum and minimum limits set for a bonus of this kind are determined only after a careful study. These limits must be equitable both to the company and the men. If the limits are too easy of accomplishment, the company can gain little. If they are too hard, the foreman will only be discouraged. The top limit must be attainable for the man who delivers exceptionally well. It has proved interesting to see what an inspiration and spur it is to the rest when the information goes out that so and so has made a perfect mark.

**THESE** sheets are for the bonus system as extended to small non-productive departments.

In the case of major non-productive departments the bonus summary is recorded on the lower form. Burden details similar to those shown on page 1446 are furnished with this statement.

Form D 200 1M 3 18

FOREMEN'S MONTHLY BONUS

Dept. - No. -  
May 19 28

(a) Service Labor and Controllable Burden of Dept.	\$ 2,500.00
(b) Productive Labor of Entire Plant	200,000.00
(c) Ratio (a : b)	1.25%
(d) Ratio -- Maximum	1.46%
(e) Ratio -- Minimum	1.15%
(f) Difference (d - e)	.30%
(g) Betterment over Maximum (d - c)	.20%
(h) Efficiency (g : f)	66.7%
(i) Maximum Bonus Points - 80	80
(j) Bonus Points Earned (h : i)	53.37
(k) Maximum Bonus Points on Personal Rating - 20	20
(l) Deductions and Reason Production in Dept. 10 delayed due to poor service	5
(m) Net Personal Rating (k - l)	15
(n) Total Bonus Points (j + m)	68.37

Form D 201 1M 3 18

FOREMEN'S MONTHLY BONUS

Dept. - No. -  
May 19 28

	Maximum Bonus Limit (1)	Minimum Bonus Limit (2)	Difference (1 - 2) (3)	Actual Percent Attained (4)	Betterment over Maximum (1 - 4) (5)	Efficiency (5 : 3) (6)	Maximum Bonus Points (7)	Bonus Points Earned (6 x 7) (8)
Ratio of Productive Labor to Productive Labor of North Plant				(c)				
	9	7	2	7.6	1.4	70	40	28.0
Ratio of Burden to Productive Labor of Dept.	60	40	20	45	15	75	40	30.0
Personal Rating (See "G")							20	16.0
Total Bonus Points							100	74.0

BASIS OF ABOVE CALCULATION

(a) Service Labor of Department	\$ 4,560.00
(b) Productive Labor of North Plant	60,000.00
(c) Ratio (a : b)	7.6%
(d) Burden of Department (Detailed List Attached)	\$ 3,600.00
(e) Total Labor of Department	8,000.00
(f) Ratio (d : e)	45.0%
(g) Deductions from Personal Rating Operating machines without guards - 4.	



# Foundrymen Meet in Birthplace

Hold Reunion of Living Organizers—Much Interest  
Displayed in Technical Sessions—Exhibition  
Large and Successful

**M**EETING in the city of its birth 32 years later, the American Foundrymen's Association held a general meeting and exhibition last week in Philadelphia, May 14 to 18. It was in 1896 that the concerted effort of a few live foundrymen brought to a culmination a movement which has grown to its present very large proportions. The gathering this year was both a reunion and a celebration and resulted in one of the most successful conventions of recent years. It was the fourth one held in Philadelphia, others falling in 1907 and 1919.

A feature was the very decided interest manifested in any session associated with gray iron. And a new development was four sessions on cupola operation, which attracted much attention. Attendance at most of the sessions was remarkably large. At 17 sessions nearly 45 papers and several committee reports were presented by leaders in each important field. Total registration was about 6000, which is a record. Of these, about 1200 were representatives of exhibitors.

The exhibition of equipment, while not the largest the association has conducted, was eminently successful. Notable was its compactness, housed under one roof of the Commercial Museum. It is discussed in some detail in this report.

Commemorating the birthplace of the organization of the A. F. A., a special dinner was given to as many of the living organizers as could be present.

## Dinner Tendered to Living Founders

**A**N entirely informal and convivial occasion was made of the dinner tendered by the association to members who were present when the foundrymen's association was formally organized in Philadelphia in May, 1896. Over 30 signified their intention to be present and nearly all of these were able to attend. A list of those who sent acceptances will be found on another page.

On Tuesday evening, May 15, at the Manufacturers' Club, which stands on the site of the old building in which the A. F. A. was formed, these original organizers, together with some of the officers, directors and past officers of the association—in all about 50—gathered around tables presided over by S. T. Johnston, chairman of the committee which planned the reunion. Many greetings and reminiscences were exchanged previous to the dinner by men who had not seen one another in many years.

No formal post-prandial addresses were scheduled, but the chairman, on each side of whom sat Howard Evans and Walter Wood, who were considered as specially honored by this occasion for their pioneer work and their continued activity to the present day,

called on various foundrymen to speak.

Walter Wood traced the early steps in the formation of the A. F. A. in 1896, pointing out that it was due to the efforts of the Philadelphia Foundrymen's Association in interesting the Western group and others to come to Philadelphia in May, 1896, and form a national organization. He emphasized the fact that in those days only a spade and a shovel were the molder's tools, but today an inspection of the modern exhibition revealed how machinery was revolutionizing the foundry. Mr. Wood stressed his belief that co-ordination of research was the next step which the foundry industry most needed to take.

Howard Evans, still secretary of the Philadelphia local organization, said that the Philadelphia Foundrymen's Association, when it started the A. F. A., really laid the foundation for many other technical, business, and trade associations. He said that one inspiration leading to the formation of the national organization was a consideration of business ethics and of the demoralization of price cutting.

By special invitation, John A. Penton, one of the association's

founders and its first secretary, addressed the old-timers. He said that if he had been fortunate in any way in his early association with the A. F. A., he attributed it to the character of the men he worked with. Recalling some of the circumstances surrounding the first meeting, which was the result of a call sent out by the Philadelphia Foundrymen's Association, he mentioned the first officers, only three of whom are still living, and pointed out that the Philadelphia meeting in 1896 was really the foundation of two large societies—the A. F. A. and the National Founders' Association. Looking to the future, Mr. Penton said that those industries that are going to survive are the ones having the most forward-looking policy, and added that research must more and more be a factor. In this he hoped the newly formed Gray Iron Institute would be influential.

The retiring president, S. W. Utley, pointed out that Philadelphia has become the birthplace of so many important organizations that the mayor may need a social secretary to keep track of them. He paid a warm tribute to Secretary Hoyt for the success of the association in recent years.

Other speakers were W. H. Mc-



Fadden, Ponca City, Okla.; C. E. Hoyt and George C. Davies. When the question was asked if any were

present who had attended every convention, John J. Hill, president Hill & Griffith Co., Cincinnati, arose.

## Gray Iron Topics at Three Sessions

THREE sessions were held on the general subject of cast iron. The first one, under the chairmanship of R. F. Harrington, Hunt-Spiller Mfg. Corporation, Boston, was devoted to cupola developments in the founding of cast iron and was featured by three papers. The second cast iron session, under the chairmanship of J. W. Bolton, Lunkenheimer Co., Cincinnati, dealt with cupola metal, temperature measurements, test bars, and the influence of carbon and silicon variations. The third cast iron session, under the chairmanship of Dr. H. W. Gillett, Bureau of Standards, Washington, was devoted primarily to research questions and was concluded by a report of the committee on gray iron.

### Test Bar for Testing Hardness

IN the absence of the author, M. Dudouet, foundry manager Société Métallurgique de Normandie, Paris, France, his paper was read by Willard H. Rother, Buffalo. Its title was: "Study on the Use of a Hardening Test for Cast Iron with Medium Silicon Content," and it was presented on behalf of the Association de Technique de Fonderie de France. The paper was devoted largely to the development of a form of test piece for making hardening tests with medium and high-silicon content in the iron. The author traced the influence on the depth of hardening produced by the thickness of the test piece, its width, the character of the

chill used and its temperature, the humidity of the sand, the temperature of pouring, etc. Variations in these properties were traced by means of diagrams.

To insure comparability of results, it is necessary that all the factors affecting the hardening should be maintained strictly constant. With such precautions the author concludes that it is unquestionable that two test pieces, cast from the same metal at the same temperature, will show practically similar depths of hardening.

In opening the discussion on this paper, John Shaw, Southsea, England, expressed the opinion that the test as outlined is not

sufficiently practical for foundry purposes. The time required for making it was believed to be too great. He described briefly his own methods of making a wedge 6 in. long, 4 in. wide, and varying in thickness from 2 in. at one end to a point at the other. By means of this wedge a rough idea can be obtained of the silicon and carbon contents at various points and the depth of the chill can be measured. The chill described in the paper was characterized by Mr. Shaw as too complicated for ordinary shop purposes. He believes that the whole question gets down to one of economics, in utilizing the method which can be handled to best advantage and at lowest cost.

### Influence of Carbon and Silicon Variations

ORAL presentation was made by D. G. Anderson of the paper prepared by Mr. Anderson and G. R. Bessmer, foundry engineers Western Electric Co., Chicago. The title was "Influence of Carbon and Silicon Variations in Gray Cast Iron." The paper was brief, consisting in presentation of results from 23 heats melted in an induction electric furnace with magnesia lining. Several curves and tables were given, showing results on the 1.10 per cent silicon series, the 2 per cent silicon series, and the 2.20 per cent silicon series. Broken test specimens were exam-

## Men of the 1896 Convention Who Sent Acceptances for the Reunion Dinner

C. W. ASBURY,  
Enterprise Mfg. Co. of Pa.,  
Philadelphia.

ARTHUR E. BARLOW,  
Barlow Foundry Co.,  
Newark, N. J.

WILLIAM J. COANE,  
Ajax Metal Co.,  
Philadelphia.

CAPT. JAMES L. CRAWFORD,  
Philadelphia.

J. M. DARKE,  
General Electric Co.,  
West Lynn, Mass.

GEORGE C. DAVIES,  
Pilling & Co.,  
Philadelphia.

WILLIAM J. DEVLIN,  
Philadelphia.

HENRY DRINKHOUSE,  
Elkins Park, Pa.

HOWARD EVANS,  
Philadelphia.

A. I. FINDLEY,  
The Iron Age,  
New York.

GEORGE W. FRENCH,  
J. J. Mohr & Son,  
Philadelphia.

WILLIAM E. FULTON,  
Waterbury Farrel Foundry &  
Machine Co.,  
Waterbury, Conn.

JOHN HILL,  
Hill & Griffith Co.,  
Cincinnati.

GEORGE T. JOHNSON,  
George T. Johnson & Co.,  
Philadelphia.

S. T. JOHNSTON,  
S. Obermayer Co.,  
Chicago.

E. J. LAME,  
R. D. Wood & Co.,  
Philadelphia.

JOHN A. LOGAN,  
Atlas Steel Casting Co.,  
Buffalo

GEORGE C. MATLACK,  
Wm. Cramp Ship & Engine Bldg.  
Co.,  
Philadelphia.

JOHN A. PENTON,  
The Foundry,  
Cleveland.

CHARLES PETTINOS,  
New York.

GEORGE T. PETTINOS,  
Philadelphia.

G. R. REBMANN,  
Philadelphia.

HARRY F. REBMANN,  
Mt. Airy, Philadelphia.

FREDERICK A. RIEHLE,  
Riehle Brothers Testing Machine  
Co.,  
Philadelphia.

BARTLETT M. SHAW,  
Walker & Pratt Mfg. Co.,  
Watertown, Mass.

S. D. SLEETH,  
Cambridge Springs, Pa.

JAMES S. STIRLING,  
Wilmington, Del.

H. R. VALENTINE,  
M. D. Valentine & Brothers Co.,  
Woodbridge, N. J.

VAN LOAN WHITEHEAD,  
Buffalo.

WALTER WOOD,  
R. D. Wood & Co.,  
Philadelphia.

J. A. STEINMETZ,  
Morris Building,  
Philadelphia.

ined and photomicrographs were shown.

The authors concluded that the total carbon content of gray cast iron of 2 per cent or higher in silicon may be somewhat reduced without materially increasing the amount of combined carbon in the casting. This reduction of carbon for these irons was reported as resulting in some improvement of physical properties.

Opening the discussion, James T. MacKenzie, American Cast Iron Pipe Co., Birmingham, referred to the deflection calculations shown in one of the author's tables. Mr. MacKenzie had calculated roughly the modulus of elasticity from the deflection figures given for the various tests. He found that these varied considerably, going as high as 25,000,000 for test No. 5 in the 1.10 per cent silicon series and as low as 9,800,000 for test No. 11 in the 2 per cent silicon series. He recommended the use of this calculation showing modulus of elasticity in studying the properties of cast iron.

Another speaker reported the practice of molding with the heavy section at the top instead of the bottom, and using appropriate gating so that the light sections at the bottom would be properly filled. He reported getting far better results in his castings by this means than by any other which he had used. In response to a question as to the entire accuracy of the colorimetric method of determining the amount of combined carbon in the iron, Mr. Anderson agreed that it is not thoroughly accurate, but stated that it had the advantage of being inexpensive and of giving results which might be relied upon as sufficiently accurate within the practical limits of foundry operation.

#### Heat Losses from Hot-Metal Ladle

**D**ETERMINATION of the heat losses from a 75-ton hot metal car of the Pollock type were reported in a paper by William F. Roeser, consulting physicist Bureau of Standards, Washington. The car was divided into seven zones and temperature measurements were made at various places around each zone. It was found that the cooling rate varied considerably during the course of a single determination. One table shows a loss of temperature in the molten metal of 63 deg. C. in the first hour and only 78 deg. in the succeeding 10 hours. In fact, the second hour showed only 12 deg. and there was a gradual reduction hour by hour until the last four showed 6 deg. each.

Calculations were made of the radiation losses from the surface of the ladle, as well as convection losses and conduction of heat through the lining. The average value of the heat losses worked out at about 140 B.t.u. a second.

Calculation of the specific heat for molten iron was made from the determinations in the test. This was placed at about 0.23. This

value, it was stated, may be in error, due to the fact that the weight and rate of cooling of the slag were not known and that some of the iron was freezing in with the slag.

It was concluded finally that metal tapped from a blast furnace at about 1500 deg. C. (2732 deg. Fahr.) can be held for 40 hr. before freezing. As a matter of fact, one case was cited where a ladle of metal went off the track and it was not possible to pour it until 36 hr. after it had been cast. While there was a large skull left in the ladle, it was successfully poured after that interval.

#### Temperature Measurements of Molten Cast Iron

**O**PTICAL pyrometers were given a rather poor bill of health in a paper by H. T. Wensel and W. F. Roeser, Bureau of Standards, Washington. Many comparisons were cited in the paper between the readings of the optical pyrometer and those of the thermocouple, in which a wide variation was shown between the two, resulting in necessity for a considerable correction to optical pyrometer readings before they can be accepted as accurate. If this correction were uniform, or reasonably so, this might not cause trouble, but as a matter of fact they varied considerably, being greatest not only actually, but proportionately, at highest temperatures. In one table these variations ranged from 3 per cent at a temperature around 1200 deg. C. to 8 per cent at a temperature around 1500 deg. C. A difference of more than 10 per cent was shown in one case, where the thermocouple gave about 1600 deg.

One explanation of the variance was given as a change in the surface emissivity around 1375 deg. C. on cast irons. It was conjectured that this transition might be from liquid to solid oxide or from liquid to solid slag. While the melting points of the various oxides of iron are higher than this, it is believed by the authors that the solid oxide formed below that temperature is comparatively insoluble in molten iron, while the molten oxide formed above that point goes into solution as fast as it forms.

Discussion on this paper centered largely on whether the alloy additions in the heat were made in the ladle or before. It developed that some of the additions were made in the ladle or at the spout, while others were made in the furnace before the heat was poured.

#### Recent Developments in Cupola Metal

**P**POINTING out that our object in foundry practice is primarily to make a better and a cheaper gray iron, John D. Miller, of the Cresson-Morris Co., Philadelphia, read a paper entitled "Some Recent Developments in Cupola Metal." The engineer is continually demanding stronger irons

with higher tensile strength, and at the same time demanding a refinement in the irons for pressure work and a high machinability. In his plant the author stated that some cupola metal had been poured into bars giving as high as 65,000 lb. to the square inch in tensile strength. This is about three times the strength of what formerly was considered a regular foundry metal and it costs only a few cents more a ton to produce it.

Regarding iron made in the electric furnace it was pointed out that the additional strength over cupola metal is about 10 to 25 per cent, but it costs 25 to 50 per cent more to produce this result. Consequently the comparison of the two metals is not fair to the cupola, unless the difference in the cost is indicated at the same time.

There are other qualities besides tensile strength which are important in iron. There is unquestionably a demand and a place for cast iron of the usual grades. Nevertheless the speaker advocated an extension of the use of high-strength cast iron.

#### Castings of High Strength

**I**N the discussion P. T. Bancroft, superintendent John Deere Harvester Works, East Moline, Ill., stated that the gray iron foundry is not slipping back very far, despite the lugubrious statements of some critics. The strength of our metals in general is getting better. Formerly it used to be believed that 5 or 10 per cent of steel scrap in the charge was the limit which could be used satisfactorily in foundry practice. Now, however, it is found that a charge of all steel can be used under proper precautions and control.

Lots of castings are made, according to James T. MacKenzie, where fluidity is the paramount consideration, rather than a strength of 65,000 lb. to the square inch. Along this line David McLain, Milwaukee, stated that, when it was found possible to attain a strength of 45,000 lb., there was no demand discovered for such a cast iron. As a matter of fact, he said that his company had not yet been asked for it.

For high-tensile cast iron, one speaker reported using a charge including 96 per cent of steel rails. His practice is to add ferromanganese and 75 per cent ferrosilicon to the charge, getting from the spout a metal containing 0.65 per cent manganese and from 1 to 1.25 per cent silicon. Additions in the spout were made to get a silicon up to 2 or 2.5 per cent and other additions for nickel from  $\frac{3}{4}$  to  $1\frac{1}{4}$  per cent.

In obtaining these results it is found desirable to melt with a very high coke bed—up to 48 in.—thus resulting from the start in a very hot metal. Readings with the optical pyrometer show this metal to run from the cupola at 2700 to 2800 deg. Fahr. Equally good results were reported from a 36-in. and a 60-in. cupola. The maximum

## Contributors to Gray Iron and Non-Ferrous Programs



L. E. GILMORE



W. F. ROESER



J. D. MILLER



E. F. HESS

test showed 69,800 lb., with an average running around 65,000 lb. Only a half dozen heats were made, all experimental and each resulting in about 1500 lb. of castings.

Not better iron but better castings is what we are after, accord-

ing to R. F. Harrington. This opinion was voiced also by other speakers in discussing the paper. Unless the castings will do what is expected of them the quality of the iron going into them is a secondary consideration.

and silicon contents found on analysis.

### Research Problems of the Gray Iron Foundry

ORGANIZED research can be applied with advantage to the engineering properties of gray iron, according to J. W. Bolton, who read a paper on the topic carried in the crosshead. It is known that the properties of the metal depend largely on the absolute and the relative amounts of graphitic and cementitic carbon and on their distribution and size. The silicon and total carbon content are the most important composition factors influencing these carbon forms.

Mr. Bolton classified gray iron into 40 groups, according to their silicon and carbon content. The latter ranged from  $2\frac{1}{2}$  to more than  $3\frac{1}{2}$  per cent and the silicon from  $\frac{3}{4}$  to more than  $2\frac{1}{2}$  per cent. He gave a large amount of tabular material from tests and showed correlation among these several groups of irons. In particular, he showed a certain correlation between castings and test bars made from the same ladle of metal. A number of specific cases of castings came up for discussion in this connection.

Interpretation of test results and discussion of his data were given in considerable detail. He concluded that extension of systematic research will furnish foundrymen with proper information on the properties of their product. It was admitted that the job of obtaining this information is going to be large, but the author believed that progressive foundrymen would undertake the task.

Consideration of pouring temperature or the original superheat in the metal, in addition to composition and cooling rate of the metal, must be had, according to Dr. Richard Moldenke, Watchung, N. J. He cited this as a third important factor in our study of con-

## Research and Practice in Gray Iron

OPENING the session on research methods and plans, Doctor Gillett pointed out that the term "research" is applicable only when we do not know what we are going to find out. He compared it with the old-time navigation, particularly that of the day of Columbus and immediately afterward. Cartographers put continents and islands on old maps in a haphazard way and eventually the map assumed a form which made it possible for the navigator to reach any predetermined destination with the least possible loss of time and effort.

Enlarging upon this theme, Doctor Gillett said that the gray iron industry needs charts showing all the data available, if it is to make progress. Only by filling in the unknown territory and thereby eventually producing a completed whole can this result be achieved.

### Theory or Practice in Gray Iron Foundry

SPEAKING extemporaneously and covering a considerable field not carried in his paper, John Shaw, of Southsea, England, presented a paper on the above topic. He dealt in his paper largely with the theoretical side of cupola practice and the relationship of the various elements to the resulting iron characteristics. Melting temperatures and investigations of the effect of the size of the test bar were discussed.

The author took up a large

number of Maurer's results, with the aid of three lantern slides in which he had segregated into groups the Maurer tests. These groups were based on certain uniformity of results under varying sets of conditions.

Working from these diagrams Mr. Shaw expressed himself as very much opposed to using as a base the sum of the total carbon and the silicon for comparative work, unless the total carbon is practically uniform and other conditions are unchanged. Otherwise, he said, the variations will result in giving discordant conclusions.

Another practice which Mr. Shaw deplored was the use of the pearlitic theory. He said that it is perfectly possible to obtain pearlitic iron which is exceedingly poor in its practical qualities, and equally possible to obtain excellent pearlitic iron. From this he argued that pearlite alone is no criterion as to the suitability of the iron for any given purpose.

Discussing Mr. Shaw's paper, J. W. Bolton stated that the sum of the total carbon plus a percentage of the silicon gives a much better base to work from than the total carbon plus total silicon. Formerly one-fourth or one-third of the silicon had been used by different investigators. Using 30 per cent of the silicon as an addition to the carbon was recommended. Under this arrangement the strength results, according to Mr. Bolton, fall into proper relationships with the reported carbon



## Chairmen of Three Technical Sessions



N. K. B. PATCH



A. E. HAGEBOECK



J. W. BOLTON

ditions. He expressed the opinion that it is impossible to correlate results from a test bar with those from the casting. This was in direct opposition to Mr. Bolton's findings.

That there are several difficulties in this correlation was pointed out by John Shaw. He questioned the use of the shear test in this connection. Discussing the testing, James T. MacKenzie referred to transverse strength, as well as tensile and shear strength, as being due largely to the size and character of graphitic inclusions in the metal. Deflection of the test piece, on the other hand, representing ductility, is based on the amount of these inclusions.

### Committee Reports

**P**RESENTING the sub-committee report on refractories for the gray iron foundry, James T. MacKenzie told of sending out questionnaires to about 200 selected foundries and receiving replies from 56. In general, the data obtained were disappointing. Refractory costs, including labor, were reported as varying all the way from 5c. to the ton of castings to \$1.68 a ton. These two extreme figures were reported from two foundries of about the same size. Relations of stack area to tuyere area are varied in the different cases from 1½ to 1 as a minimum, to 9.9 to 1 as a maximum. Charges on a 72-in. cupola varied from 3600 lb. to 12,000 lb.

Analysis of the slag is something which apparently is outside the knowledge of nearly all foundrymen. Very few reported on this. Heats obtained for each lining of the cupola varied from a single heat in a foundry which re-lines after every heat to a run of six months, representing perhaps 150 heats, in another case. The hours of operation on the melting zone on each lining varied similarly, from 9 in the case of the single heat to 3600.

Following the presentation of the two papers, Mr. MacKenzie presented, in the absence of Mr. Jones, the chairman, the report of the committee on gray iron. An investigation is under way, in conjunction with the American Ceramic Society, on the enameling of cast iron. One of the items on the program of the committee is a fluidity test, involving among other things viscosity, which is important in connection with filling of the mold. Another problem is that of liquid shrinkage. This is particularly important in connection with high-test cast irons, while wear tests and machinability are of value as affecting the usefulness of gray iron castings.

Determination of the gases in the iron is a problem now being worked on by the Bureau of Standards. Relationship of the iron-carbon alloys is to be studied by the committee, in conjunction with a committee of the American Iron and Steel Institute and other interested groups.

### Automatic Air Control for Cupolas

**T**HE necessity of close control of air in the melting operation in a foundry cupola and the arrangement of equipment intended to assure such control, were dealt with in a paper on "Automatic Blast Gate Control for Cupolas," by H. V. Crawford, industrial department General Electric Co., Schenectady, at a session devoted to cupola developments.

Air should be charged by weight, not by volume, said Mr. Crawford. Only 23 per cent of standard air is oxygen; therefore only this portion fulfils the purpose for which the air is introduced, and the other 77 per cent works against the melting operation. The total weight of air used during any heat is more than the combined weight of the coke and iron, which fact emphasizes the importance of air control.

In discussing the amount of air required it was pointed out that

for a 10 to 1 fuel ratio, 24,000 cu. ft. of air instead of 30,000 cu. ft., is all that is required to melt a ton of iron. This is based on good coke having about 88 per cent fixed carbon, and takes account of carbon taken up by carbon dioxide, also of air leakage, etc. If the 30,000 cu. ft. figure is used 25 per cent too much air, or 25 per cent too much oxygen, is introduced to exist as free oxygen and oxidize the iron. Also, 25 per cent more inert gas is introduced to help retard the melting operation. More coke can be added, he said, but this decreases the ratio and slows up the melting rate.

Calculations in the paper were based on the weight of air at standard conditions of 14.7 barometer and 60 deg. Fahr. temperature. It was pointed out that these conditions were not always standard because the air temperature will vary from zero to 100 deg. in some localities and the barometer will also vary. The weight of a given volume of air will therefore change with the temperature and barometer, and therefore blowers should be operated to give constant weight, rather than constant volume.

The effect of temperature, barometer and humidity were briefly discussed, and in concluding this section of his paper Mr. Crawford said: "The above figures show that a serious error is made if the air required is figured on the old basis of 150 cu. ft. of air per pound of coke, or 30,000 cu. ft. for a ton of iron for all conditions of the intake air. At the minimum conditions of 0 deg., 15.2 barometer and no humidity, the excess of air or oxygen will be the difference between 30,000 and 20,500 cu. ft., or 46.5 per cent.

The effects of too much and too little oxygen, and the part that air pressure plays in the melting operation were outlined, and the apparatus for automatically assuring the supply of a constant weight of air to the cupola, irrespective of atmospheric conditions and the resistance through the cupola, were described in detail. This is an electrical control system connected with the line supplying the current to an electrical motor which operates the centrifugal compressor. This control operates a blast gate placed in the pipe between the blower and the cupola. Details of the system, such as the hand and automatic blast gates, control panels, meters, etc., as well as test and operating curves, were shown by means of lantern slides. The equipment was also demonstrated at the booth of the General Electric Co., during the exposition.

### Describes Manufacture and Properties of Cupola Blocks

**"CUPOLA Refractories,"** by C. E. Bales, Ironton Fire Brick Co., Ironton, Ohio, was another paper at the session devoted to cupola developments. The clays used were described and the manufac-

ture of the blocks by hand, by machine and by dry press method were outlined and pictured by lan-

tern slides. A section of the paper was devoted to the properties of various types of cupola blocks.

## Steel Foundry Problems Reviewed

THREE sessions were devoted to steel foundry subjects. Eight papers and several important committee reports were presented. One session was given over largely to alloy castings and to heat treatment, another to foundry practice and a third to general topics. W. J. Corbett, Steel Founders' Society of America, Pittsburgh, was the chairman of two of the sessions, and J. Fletcher Harper, Allis-Chalmers Co., Milwaukee, presided over the other. In the following account it is possible to touch on only a few of the papers.

A PAPER which attracted considerable attention was the fourteenth in a series of exchange papers between the Institute of British Foundrymen and the A. F. A. It was contributed by F. A. Melmouth, manager of steel foundry, Thos. Firth & Sons, Ltd., Sheffield, England, and entitled "Variables in Steel Foundry Practice." In the absence of the author it was presented in abstract by George Batty, director of research Steel Castings Development Bureau, Philadelphia, an old friend and co-worker of the author.

### British View of Foundry Practice

Mr. Melmouth's paper is quite long and deals with many phases of the subject. Briefly he says that factors influencing to the largest extent the production of a steel casting are: The human element; various molding operations; metallurgical behavior of the steel in the form of a sand casting, and heat treatment. Each one of these factors are treated in detail.

Castings have been described, says the author, as "badly designed ingots" and with this he is quite in agreement. Considerable research is still necessary to produce an ideal or "perfect" steel casting which is also true of the ingot. The lower the carbon content, the more difficult to produce a casting free from unsoundness of the porosity type. In normal quantities silicon has very little effect on physical properties, but high silicon in mild castings tends to produce coarse ferritic structures with lower strength and impact resistance. Serious variations in manganese, Mr. Melmouth says, should be avoided. As to sulphur, 0.06 per cent can be taken as a perfectly safe upper limit. As to processes it is not true that theoretically steels of equal general composition should behave similarly, irrespective of process. Based on their comparative ability to produce steel with a degree of fluidity high in proportion to the temperature, the author places the converter first, the single slag electric furnace second, the open-hearth third and the double slag electric fourth.

Various deoxidizers such as aluminum, ferrotitanium and calcium carbide are discussed as is also heat treatment. The great majority of specifications for mild

steel castings can be met by a straight annealing, cooling either in the furnace or in the air, depending on the type of casting being handled. Faults directly attributable to incorrect manipulation during treatment are due to too low a temperature, too high a temperature or too short a period at temperature.

In the discussion Major R. A. Bull, research director Electric Steel Founders' Research Group said that the author's views on sulphur and phosphorus correspond closely to those in this country, so far as they have been determined. Interest was displayed in the question of tarring steel casting molds, and this was explained by Mr. Batty as resulting in a casting with a better surface and one more easily cleaned, also one less liable to burning in.

Many opinions were expressed in the use of deoxidizers, particularly aluminum. It was generally agreed that this deoxidizer must be used to offset the bad effect of green sand molds, but no more should be used than necessary. The use of silicon-zirconium was suggested as being both a deoxidizer and a diffuser of sulphur.

### Less New Sand Needed

NEW information on steel foundry sand problems is contained in a paper "Reducing New

Sand Consumption in the Steel Foundry" by H. A. Mason, assistant to superintendent Gould Coupler Co., Buffalo. The author, who presented the paper, described a new system of reclaiming sand by which economies far beyond their expectations were realized. New sand consumption has been reduced from 1200 lb. to 300 lb. per ton of good castings. Clay consumption has dropped from 150 lb. to 80 lb. per ton. Savings made have averaged \$3,500 per month. Thus the original investment of \$3,000 for the sand reclaiming unit and the small additional cost for a high grade bonding clay is considered as money well spent.

### Three Kinds of Alloy Castings

A PAPER of considerable interest is entitled "General Characteristics of Alloy Steel Castings," by J. W. Frank, chief metallurgist Chicago Steel Foundry Co., Chicago. A statement which met with a cordial response was to the effect that foundrymen have all seen a tendency to advertise extensively steels with fancy names or even numbers, steels with varying contents of carbon and manganese, which cannot be compared to the real alloy steels which carry, in addition, nickel, chrome, vanadium and molybdenum.

Mr. Frank divides alloy steel castings into three distinct classes. First are those having high physical properties; second, those with extraordinary properties such as resistance to corrosion and magnetic permeability, and in the third classification he puts heat-resisting alloys. Manganese, nickel, nickel-chrome, chrome-vanadium and molybdenum alloy castings are then discussed in some detail.

As to molybdenum, he says straight molybdenum steel is not common in castings at the present time, the molybdenum usually running 0.20 to 0.40 and sometimes as high as 0.80 per cent. The main advantage in this alloy is the relative ease in welding such castings to other parts in fabricating.

## Authors of Steel Foundry Papers



H. P. EVANS



H. A. MASON



G. O. CARTER

Molybdenum in conjunction with chromium produces a steel, the use of which is increasing by leaps and bounds, says the author. The addition of molybdenum to nickel-chrome steel results in a metal that should be of particular interest to foundrymen. It retains all the good quality of the nickel and the chromium, the ease of machining of the chrome-molybdenum steel and, in addition, has the peculiar characteristic of hardening almost as hard by air quenching as if a liquid medium were used.

#### Special Heat Treatment for Castings

AN interesting description of a heat treatment plant for miscellaneous steel castings was presented by A. W. Lorenz, metallurgist Bucyrus-Erie Co., South Milwaukee, Wis. It is a modern plant, uniquely equipped for the full quenching and tempering of miscellaneous steel castings. With this plant an output of over 500 tons per month may be obtained at a cost of about  $\frac{1}{2}$ c. per lb. It has been found, said the author, that when certain types of alloy steel castings are subjected to quenching treatment, their physical properties may be improved from 50 to 100 per cent. When such results can be obtained at a relatively small increase over the cost of casting, the subject of heat treatment becomes a lively issue, suggesting many applications which would otherwise be prohibited.

The author's statements are based upon his company's experience with heat-treated castings for

over a period of 18 years and it is interesting to note that at the present time approximately one-third of the entire foundry output is a fully quenched and tempered product.

In the discussion in which the author answered numerous questions, it developed that all castings are annealed first before quenching and tempering.

#### Economies in Oxyacetylene Cutting

LARGER risers and more pouring gates are now used than in earlier steel foundry practice, because an ample reservoir capacity above the casting is essential to compensate for shrinkage and thus prevent pipes and blowholes. This is made possible by economies in oxyacetylene removal of such risers, said G. O. Carter, consult-

ing engineer Linde Air Products Co., New York, in a paper entitled "Economies in Oxyacetylene Cutting for Riser Removals." In this way the foundry is sure of getting a good casting when small risers and gates are used.

#### Other Papers

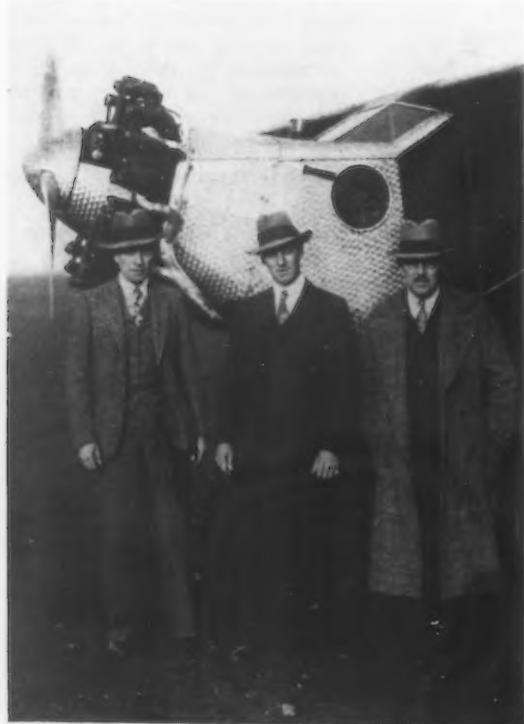
OTHER papers presented at the steel foundry sessions were "Manganese Steel," by H. P. Evans, metallurgist Pettibone Mulliken Co., Chicago, describing in some detail the metallurgy and heat treatment of high-manganese steel castings, as well as their uses, and a description of an interesting new research steel foundry laboratory contributed by W. C. Hamilton, research director American Steel Foundries, Indiana Harbor, Ind., entitled "Research Laboratory—American Steel Foundries."

## Specification Controversy Unsettled

AT the close of one of the sessions the chairman of the committee on steel castings, A. H. Jameson, Deemer Steel Casting Co., New Castle, Del., made a report, the discussion of which consumed much time. It dealt with the old controversy concerning the specifications for flanges, valves and fittings of carbon steel castings for high temperature use. Reference was made to the action which was taken a year ago at the A. F. A. convention in Chicago and at the annual meeting of the American Society for Testing Materials when the serious differences of

opinions which existed were referred back to the committee.

Mr. Jameson then related the attempts that have been made to effect a compromise by the appointment of an arbitration committee. Failure resulted in the formation of this committee, as suggested by the A. S. T. M., but a compromise was suggested by those interested which did not meet with the approval of the A. F. A. committee. The compromise was to the effect that the words "other approved processes" should be used in the specification, instead of eliminating the names of the converter or



### Flew to Convention

AIRPORT facilities as well as railroad connections may soon play an important part in the selection of sites for future A. F. A. conventions if the experience of W. F. Piper, E. O. Beardsley and L. W. Kreicker (reading from left to right) of the Beardsley & Piper Co., Chicago, maker of sandslingers and other foundry equipment, may be taken as a precedent. These men went to Philadelphia from Chicago by airplane in order to save time in transit and be present at the opening of the exhibit. Messrs. Beardsley and Piper have retained confidence in airplane travel in spite of the fact that about six weeks ago they went into a nose dive near Sharpsville, Pa., the crash resulting in injuries which for a time threatened Mr. Piper's life.



the crucible process. It was also suggested as a compromise that the sulphur limits be raised from 0.05 per cent to 0.06, but the stipulation of definite limits for carbon, manganese and silicon were still to stand.

R. A. Bull presented a lengthy minority report, urging the adoption of the so-called "Cleveland compromise" as the only solution to a controversy which had lasted altogether too long and which was doing harm to the producers of this particular grade of castings and to the making of specifications in general. After many opinions

had been expressed by various members present, Mr. Jameson offered a resolution that the sense of this meeting is opposed to the suggested compromise and also is opposed in principle to the inclusion of chemical limits where physical results are stipulated. The final vote showed a decided majority in favor of the resolution, although the total attendance at that time was but 26. Among those who took part in the discussion were John Howe Hall, one of the members of the committee and L. W. Spring, Crane Co., Chicago.

## Progress Made in Sand Control

**E**MPHASIS on the progress that is being made in sand conservation, in making successful synthetic sands and in developing satisfactory tests both in the laboratory and under practical shop conditions were brought out in the one session on sand control. Five papers and several committee reports were scheduled.

### Ferric Oxide Film on Sand Has Influence on Bond Strength

**A**LTHOUGH it has been recognized that colloidal ferric oxide films might have an important influence on the bond strength of sands, no quantitative data have been available to show the effect of the films. Such data, showing the relation of colloidal ferric oxide absorbed on the sand grains and on the clay bonding material to the strength of bond in the molding sand, and the successful preparation of synthetic molding sand, were presented in a paper entitled, "The Influence of Ferric Hydrogel in the Bond of Natural Molding Sands." G. G. Brown, professor of chemical engineering University of Michigan, Ann Arbor, who was joint author with C. C. DeWitt, professor of chemistry Michigan College of Mining and Technology, read the paper.

To investigate the cause of bond in natural molding sand, a sample of fresh Albany molding sand was adopted for testing and analysis. This sand was tested for permeability and compression, and was then separated into silica, iron oxide and clay. It was found that the presence of the natural film of colloidal ferric oxide has a measurable effect on the strength of the base sand. It was also ascertained that the absence of bond material or "clay substance" causes a marked decrease in the strength of the natural molding sand.

Synthetic molding sand was made of pure silica, kaolin and ferric hyrosol in quantities approximating the base sand, bond and ferric oxide in the natural sand. Numerous other constituents of natural molding sand that have been identified were not found essential. The synthetic sand virtually reproduced the properties of the natural molding sand. Similar results were obtained by making a synthetic bonded molding sand,

using clean Michigan City beach sand as a base.

### Why Bond Strength Decreases

**"CAUSE of the Decrease in Bond Strength on Heating Molding Sands to 600 Deg. Fahr."** was the title of another paper by the same authors. The loss in bond on heating, at least to 600 deg. Fahr. for 3 hr., is not due to any change in the ferric hydrogel absorbed on the silica, the experiments disclosed. On the other hand, heating the bond material before mixing with the silica base material causes the mixture to lose practically all of the strength lost on heating the mixture. This clearly indicates that the loss in bond on heating is due entirely to changes in the clay bond as distinct from the sand or colloidal ferric hydrogel.

### New Machine to Test Sand

"An Automatic Precision Strength Test for Sand," the title of a third paper by these two authors, describes a new machine for making compressive tests of sand. The device was built with the following considerations in mind:

1. No initial loading of sample.
2. Freedom from impact forces.
3. Constant rate of loading.
4. Automatic operation, stopping and indication of breaking load.
5. Accuracy and sensitiveness to less than 1 gm.

With this machine the compressive strength of sands is ascertained with an accuracy of plus or minus 1 per cent. Although such accuracy is probably not necessary in industrial routine testing, it is valuable in careful research work. The machine was used in the investigation of the influence of ferric hydrogel on the bond of molding sands.

### Bank Sand Additions to Core Sand

**"SURFACE Conditions of Castings as Affected by Core Sand Mixtures,"** was the title of a paper by H. L. Campbell, associate pro-

fessor of metallurgical engineering, University of Michigan, Ann Arbor. To obtain definite information on the effects of different core sand mixtures on the surfaces of metal castings, a special mold was designed which permitted a test specimen to be cast in contact with dry sand cores. The mold was formed from two cores which were clamped together in a vertical position.

The investigation showed that the most desirable properties of dry sand cores are obtained when the core sand contains grains of uniform size and of sufficient fineness to produce the required smoothness on the surfaces of the cores.

The smoothness of castings formed by contact with cores will be practically the same as the smoothness of the cores, provided the metal is sufficiently fluid when it is poured to fill the minute cavities on the cores. In all cases where smooth surfaces are required on castings, the cores which form these surfaces must be smooth.

The additions of bank sand or other finely divided materials to core sand mixtures within reasonable proportions do not improve, to any appreciable extent, the smoothness of the surfaces of castings made in contact with these cores.

### Sand Control for Gray Iron

**"SAND Control and Sand Conservation in a Gray Iron Jobbing Foundry"** was the title of a paper by T. F. Kiley, metallurgist Brown & Sharpe Mfg. Co., Providence, R. I. Various tests used in reclamation of sand are described. The company has used clay in rebonding spent molding sand since June, 1925, and shortly after that sand tests were adopted as a guide to the proper use and treatment of this material. The character of clay was found to have considerable influence over the rate of drying out of reclaimed sand. The more colloidal the clay, the less the rapidity of the drying out of the reclaimed sand.

Tests indicated that clay-treated sand bakes as strong as one of the natural sands used to a large extent on medium work; that a fine sand weaker in the green state than a coarser sand with the same amount of clay present in each case seems to bake stronger than the latter, possibly because of less rapid destruction of clay bond in the fine sand.

Fines or silt tend to accumulate in the heap when sand is repeatedly used. However, this tendency is not serious because no attempt is made to reclaim sand that adheres strongly to castings, which is removed at the cleaning room. The addition of new sand to piles on lessening in quantity, sharp sand additions on rebonding, unavoidable core droppings in reclaimed sand, formation of compound grains in casting into the sand; all these probably have their

influence in preventing such an accumulation of silt as to cause concern.

After about two and one-half years of reclaiming, light foundry reclaimed sand showed practically the same screen tests as it did in the initial stages. After the same length of time heavy foundry facing sand was found to be more open than the facing formerly used.

It was found that the best method of distributing clay in rebonding is by means of a muller type of mixer. Coarse sands rebound more readily than fine sands.

#### Permeability Decreased by Clay

Clay decreases the permeability of sand on rebonding to an extent depending on the amounts of clay used. Rebonded sands seem to increase somewhat in permeability and get coarser on using, probably on account of the clay's baking in grains and forming compound grains, and, to some extent, because of core droppings or shot accumulations in the heap. The removal of shot, remulling and rebonding seems to fine the sand down again. In fact, facing sand would get entirely too fine without silica sand additions.

Troubles attributed to the use of clay and rebonded sands in the experimental stage were found on investigation to be due either to molding practice, improper mixing or some deficiency in temper, bond or permeability.

No unusual difficulty is noted in cleaning castings made in sand rebonded with lower fusing, more colloidal clays and the life of this sand is apparently as long as higher fusing clays.

The more colloidal clays seem to give reclaimed sand more of the velvety feel of a natural sand, and the rapidity of drying out seems lessened on both heaps and molds. Higher permeabilities with the same strengths are obtainable with the more colloidal clays because of the smaller quantity used. It seems safe to assume that the less rapid the drying out, the better will the bonding agent withstand the heat action of molten metal which causes decomposition of the clay bond. Decomposition of clay bond, according to some authorities, is responsible in certain cases for cuts, washes and scabs.

Sand treated with very high colloidal clay takes very little water without getting muddy when the slicking tool is applied. Apparently, in swabbing, most of the water is absorbed near the surface and, when a slight excess of water is present, this is quickly brought to the surface by slicking. A molder has to be careful in the use of a swab when using sand rebonded with this type of clay.

When asked whether it is possible to "overmull" sand, Mr. Kiley said his company tried to keep mulling time down to a minimum. Reclaimed sand is ordinarily mulled dry for 1 min. and then for 3 min. during tempering.

A. A. Grubb, Ohio Brass Co., Mansfield, Ohio, interposed that it is not necessary to mull so long with colloidal clays as with other rebonding materials.

#### Sand Control in Light Castings Foundry

**M**ETHODS of testing and controlling sand in a light castings foundry of the mechanical handling type were outlined in a paper by W. G. Reichert, metallurgist Singer Mfg. Co., Elizabeth-

least several hours before cutting over, allowing the moisture to distribute uniformly, as in floor molding, will ball up very slowly. It is generally known that sand becomes coarser through handling, and this effect is of greater magnitude with mechanical handling.

Observations in the Singer plant indicate that the balling of sand is due to the movement of the sand containing a critical moisture content, together with an uneven distribution of moisture, and that

### Authors of Sand and Cost Papers



J. J. EWENS



M. A. BLAKEY



T. F. KILEY

port, N. J. Natural sands submitted for trial are subjected to the following tests to determine their suitability:

1. Tensile strength test.
2. Permeability test.
3. Grade test.
4. Dry strength test.
5. Durability test.
6. Relative fusion test.
7. Microscopic examination.

A sand possessing a low fusion point has a tendency to adhere to the casting, especially in the corners where its cost of removal is sometimes very large. It is also the experience of the Singer company that sand with a low fusion point tends to produce an inferior surface.

Mulling tends to bring out the latent strength value of the sand to a marked extent, depending on the time mulled and the clay content.

To determine the effect of using heavier rolls in mulling sands, rolls weighing 1 and 2 tons were compared under identical conditions for a 10-min. mulling period. The heavier rolls also had a 40 per cent larger face surface than the lighter rolls. The heavier rolls were found to give a better distribution of clay, as indicated by an increase in strength, and also have a greater tendency to break down the grain clusters.

Sand deteriorates considerably because of the coarsening of the sand from the balling of the fine grain particles of clay. Sand that is moistened and remains for at

least several hours before cutting over, allowing the moisture to distribute uniformly, as in floor molding, will ball up very slowly.

Balling may be counteracted by the addition of a fine sand, a lower clay content sand, mulling, improvement in handling conditions, or a combination of these.

Moisture variation was reduced and a uniform facing sand was insured by attaching a water meter to the muller, as well as by constantly checking the sand with a laboratory moisture tester.

The Singer company first attempted to reclaim sand from tumblers, which consisted of about 4 per cent iron dust, by converting the iron dust into ferric oxide by an "aging" process; the sand later being made into a substitute for natural sand by mulling with the proper addition of clay. After a long period of use the surface quality began to deteriorate and at the same time the fusion point declined because of the gradual accumulation of iron oxide. For this reason the experiment was discontinued.

Now the company is successfully reclaiming the burnt sand that clings to the sprues and gates, which is not contaminated with iron.

In the discussion of Mr. Reichert's paper the question was raised whether the fusion point or the vitrification point in sand is the more important. (The vitrification point is where the sand will not take bond). It seemed to be the consensus of opinion that



both high vitrification and high fusion points are essential. M. A. Blakey, International Harvester Co., Milwaukee, pointed out that the amount of organic matter in the sand has a great deal to do with its propensity to burn on a casting. Organic matter helps his company to make good castings, he said. The reclaimed sand contains considerable core oil, pitch binder, cereal binder, etc. Better results are obtained with such sand than with new sand, he said. Scabs are

some cut and scabbed easily and some did not. Some shook out of the mold with little effort, while others became as hard as a dry sand core.

#### Subcommittee on Tests Makes Report

A NEW pamphlet, incorporating additions to and modifications to sand tests recommended in a report issued in June, 1924, has been completed by the subcommittee on tests, according to an an-

packed by mechanical ramming instead of hand ramming.

To determine the permeability of a mold it was recommended that a tube  $\frac{1}{2}$  in. in diameter and a standard rubber tip be used.

The committee is making bond clay tests, to evaluate the various bond clays used, but is not yet ready to report.

Other subjects now being studied include the following: Determining the hardness of molds; shortening the fineness test; a rapid method of colloidal determination; flow of sand in the mold, and sea coal.

#### Much Bond Clay Bought

PURCHASES of bond clay to rebond sand or to make synthetic molding sand are increasing rapidly, according to a report presented by R. F. Harrington, Hunts-Spiller Mfg. Corporation, Boston, chairman of the subcommittee on sand conservation and reclamation. One producer of bond shipped 30,000 tons in 1927, compared with 15,000 tons in 1926, and expects to ship 50,000 tons this year. One of the largest producers of motor cars used 25 carloads of rebonding material in 1927 and would have used it 100 per cent, so it reported, if it had had the equipment to do so.

#### Report on Grading Sand

THE system of grading sands tentatively adopted by the association has made definite, although slow, progress, according to a report by the Sub-Subcommittee on Grading, of which A. A. Grubb, Ohio Brass Co., Mansfield, Ohio, is chairman. There is still a strong tendency to cling to the old grade numbers, which differ widely among themselves for the same grades; in some cases the same sand is sold under two or three different numbers—these numbers being the ones with which their customers have been acquainted.

The subcommittee has proposed the terms "angular," "sub-angular" and "rounded" as descriptive of grain shapes and has prepared photographs of typical sand grains of each class.

The addition of the 30 and 50 mesh sieves to the original standard set recommended for foundry sands raised the question as to what multipliers should be used for these sieves when calculating grain fineness. The sub-subcommittee recommends that the weight or percentage of sand on each sieve be multiplied by the "approximate mesh number" of the sieve through which it passed. Inasmuch as mesh numbers differ among the testing sieve makers for sieves of approximately the same opening, "approximate mesh numbers" or multipliers have been listed along with the actual mesh numbers of both the Tyler Standard and the United States Standard openings.

In connection with the tentative standard A. F. A. dye adsorption test, the term "colloidal properties" is suggested rather than "quality

### Authors of Papers on Foundry Management



J. H. MARKS



A. D. LYNCH



J. D. TOWNE

overcome with organic matter. It can be done with flour and with sea coal.

#### A Test for Durability

"TESTING Molding Sands for Durability" was the subject of a paper by M. A. Blakey, International Harvester Co., Milwaukee. A small simple mold was made in the laboratory of each sand tested, and was taken to the foundry and poured with regular iron from a hot hand ladle. This was repeated several times with each sample of sand, but before each cast the bond strength and permeability were determined. When the tests were started it was expected that five casts would show the characteristics of sand quite well, and for natural molding sands they have done so. For synthetic sands, however, at least 10 casts were necessary, as the durability of the synthetic sands was much greater.

Although the original purpose of the tests was to determine the relative effect of use on the bond strength and permeability, it was soon found that other information obtained through them was of equal or greater importance. Examination of the castings made during the test indicated what could be expected in the foundry if a particular sand were used. Some sands burned on and some peeled nicely, some gave a smooth finish and some a rough finish,

nouncement by the chairman, Dr. H. Ries, Department of Geology, Cornell University, Ithaca, N. Y. The pamphlet has been divided into two parts: (1) "Tentative Standard Methods of Testing," and (2) "Foundry Control Methods."

Among the recommendations of the committee is that the compressive test be the standard strength test of the association, in preference to tensile and shear tests.

In connection with the refractories test, the point was raised whether it is more important to determine the melting or sintering point, and the decision was in favor of the latter. In determining the sintering point, a specimen is rammed and a ribbon of platinum is placed on it. A current is run through the ribbon, and an optical pyrometer is used to ascertain the temperature at which the grains cling to each other and to the ribbon. That temperature is regarded as the sintering point.

In connection with the fineness test the committee recommends that sieves Nos. 30 and 50 be added to the series now in use.

After an investigation of four new shaking machines which gave results that checked very closely, the committee recommends that a milk shaker stirrer can be used instead of a rotary shaker.

A sub-subcommittee was appointed to test cores. This body recommends that test specimens be



of clay." The latter term implies that a sand of low dye adsorption value has poor quality clay, which is not a fact. A sand of low colloid content is actually superior for some purposes. Colloidal properties are also a factor in the behavior of core sands. Sands of low dye adsorption value require

less oil binder, and produce cores that bake hard but can be knocked out of castings readily.

These considerations point to the advisability of grading sands according to their colloidal properties, and it is hoped that this can be made an active matter in the near future.

## Progress in Cost, Apprenticeship and Other Subjects

AT sessions devoted to foundry costs, management and apprenticeship, as well as materials handling, a notable array of papers was provided. Some of the features of these programs are reviewed in the following.

### Uniform Cost System for Steel Foundries

FOUNDRY costs and management problems occupied two afternoon sessions, one under the chairmanship of A. E. Hageboeck and the other of H. Cole Estep, as well as cropping up in many other sessions supposedly devoted to technicalities of production or metallurgy.

Mr. Hageboeck has been chairman of a committee on foundry costs which after some extensive work has produced a report on "Cost Finding Practice for Steel Foundries." In this 36-page publication may be found a classification of accounts within the various operating departments, and supplementary notes indicating where border-line operations are to be allocated. General overhead and special charges are described in such a way that, when any foundry adopts the recommendations of the committee, the management will be assured that all items of expense are included.

It is hoped by the American foundrymen's committee that this report will form the basis of a uniform accounting system for steel foundries. This will enable all such organizations to compete on a better basis, each knowing its real costs. Lack of such data usually results in one sales organization, ignorant of its costs, following another equally ignorant one down to rock bottom in an effort to get or hold business, and to the general disorganization of business in the entire region. In view of such situations, the cost committee recommends that foundry managers in various localities should meet with the avowed purpose of adopting this uniform system, making only such rare modifications as are clearly necessary for local conditions, and perhaps jointly engaging some reputable accountant to supervise the installation of the system in all the plants.

It was also emphasized that overhead and general charges should be carried on estimate sheets on the basis of average production. This will enable a plant which is fortunate in being able to operate now at a rate consider-

ably higher than the average (which is now about 60 per cent of capacity for the whole industry) to build up a reserve against the expected swing to a low productive rate.

#### Selling by Schedule Vicious

IF foundries had been working under such a system the vicious practice of selling by schedule would never have gained headway, in the opinion of J. J. Ewens, of the George H. Smith Steel Casting Co., Milwaukee, Wis. In a paper, entitled "The Schedule Fallacy," he says that whatever justification there may have been in the days when labor was cheap to sell heavy castings at a lower rate per ton than light castings, it has vanished in these days when general overhead may be as much as twice the metal cost. Any organization which accepts work on the schedule basis will eventually find that it is making the difficult varieties at a ruinous price, while the easy ones (weighing the same per piece) are retained in the buyer's own foundry or are placed with some other which knows its costs and estimates each pattern separately.

It was pointed out from the floor that the schedule system of sales would remain as long as manufacturing costs were not known in detail and as long as the purchaser insisted on buying by weight rather than by units. Even the latter could be circumvented if the foundry would, after figuring the cost per piece, translate this into a cost per ton *for that particular pattern only*, and then absorb any profit and loss due to variation from computed weight (a matter of almost vanishing importance).

#### Bonus Paid to Reduce Scrap

AT the Ohio Brass Co., bonus for low scrap losses is paid only to the molder supervisors called "instructors," according to R. A. Greene, assistant manufacturing superintendent. Each instructor is in charge of no more than 18 molders, who are paid piece rates and consequently are penalized directly for defective

castings. Every day the production of each molder is counted up, and the defectives classified and inspected. If by the end of the week any particular molder or any particular pattern seems to be running consistently bad, it is discussed in regular Saturday meeting of the various foremen and technical representatives interested. Any loss greater than 5 per cent is given immediate attention. By this system of daily posting of records, constant watch of difficult castings, cooperation of all manufacturing departments and especially the competition between the instructors, scrap losses in the malleable foundry have been reduced to 5.3 per cent, a grand average since 1924, as compared to 9.8 per cent for a similar previous period. This amounts to about 465,000 lb. of castings a year saved from the remelt. No special clerical help is needed for the system of instructor bonus. All basic information is gathered in order to compute molders' pay. Extra work making up totals and posting records on bulletin boards amounts to a few hours per week.

#### Payment Methods to Increase Production of Salable Castings

A MANAGEMENT problem was considered in two papers before a session on malleable iron. In one "An Incentive Bonus Plan for Molders Based on Scrap Control" was described by R. J. Tee-tor of the Cadillac Malleable Iron Co., Cadillac, Mich. His is a rather young organization, set up in a region where little foundry work had previously been done. The biggest problem had been to educate the workmen to the fact that it was possible to melt iron, to make castings, and to make them at a good rate. At first piece rates were set which would give theoretically 50c. per hour to molders, and a bonus of 100 per cent of excess earnings over 50c. per hour paid. This increased the number of molds made, but increased the scrap losses at a greater rate. The bonus plan was then changed to apply on the percentage of good castings, but while this reduced the scrap losses it slowed down production.

A compromise plan was adopted early in 1926, and has operated successfully since. The molder's regular pay envelope contains his piece rates plus a bonus for production. Suppose for instance he is expected to make 100 molds daily and the rate is 5c., but his actual set up is 120. He gets 120 pieces at 5c. or \$6 plus 100 per cent bonus on his surplus of 20, that is: 20 at 5c. or \$1 more. His total pay for the day is \$7.

In addition to this he gets twice a month a separate envelope containing a bonus for the number of good castings made and his regularity at work. No supplemental bonus is paid if he fails to get at least 91 per cent of good castings, or is absent more than a

day and a half. If 91 per cent of his castings are good, this supplemental bonus is 10 per cent of his piece rate money; if 92 per cent his bonus is 12 per cent; if 93 per cent of good castings his bonus is 14 per cent and so on. Only full time for two weeks entitles the molder to this entire supplemental bonus; a half-day's absence cuts one-third off it; a full day's absence is penalized two-thirds.

Experience shows that the production bonus amounts to 8 per cent of the piece rate pay, and the supplemental bonus amounts to 10 per cent of the piece rate pay. Therefore instead of paying, say, 5c. for a mold, the average cost is 5.9c., but these bonuses amount to only 2 per cent of the total cost of the castings. While this scheme apparently runs counter to the principle that a bonus should decrease the molding price per piece, it is felt that it is justifiable on the ground that it has reduced the remelt, the hand trimming, inspection and general overhead. It has also reduced the labor turnover and is in line with the sound principle that it allows the workman to participate in the savings he is responsible for.

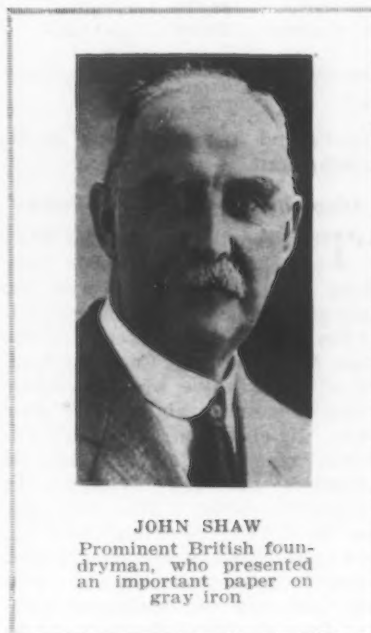
#### Horse Sense in Cutting Costs

**A**N interesting paper on "Stabilizing Labor and Cutting Costs by Horse Sense" was read by A. D. Lynch, personnel manager Ohio Brass Co., Mansfield, Ohio. Mr. Lynch said he was a cost accountant first and a personnel man second, consequently he knew that the greatest waste in industry today is in labor turnover. To stabilize labor it is necessary to give them working conditions so that they will wish to stay. Many managers fail to regard the workers as human beings, as part of the selling and manufacturing organization which must profit from the business if it is to endure. Most so-called personnel work, like athletic fields and loan associations, are frills; the essentials are rather the following:

- a. Clean buildings and attractive surroundings.
- b. Machinery, tools and equipment in good condition.
- c. Fair pay.
- d. Continuity of employment.
- e. Correct leadership.

The last is regarded by Mr. Lynch as most important. He believes that the foremen can do more to create a contented working force than any one else. But they must be well selected and trained. Several essentials of good foremanship were mentioned, such as skill and knowledge of the work, honesty, fairness, sympathy, good judgment and open mindedness. It would be the greatest mistake to interpose a so-called personnel manager between such a foreman and his men. The manager's part is rather to see to it that the foremen are kept well informed about the company's policy, and given

all facts and figures regarding the status of the business which will enable him to bring the workmen into his confidence and build up in their minds the thought that they are partners, essential to success, or contributors to failure, and will



JOHN SHAW  
Prominent British foundryman, who presented an important paper on gray iron

gain or lose as the business prospers or languishes.

#### Apprentices Trained Through Community Effort

**A** SMALL but interested audience participated in a discussion of apprentice training on Thursday morning, under the chairmanship of E. S. Sparks, secretary Metal Manufacturers' Association of Philadelphia. Hardly a member of the audience but was actively engaged in organizing or supervising apprentice training, or was employing them. As one Southern foundry superintendent put it: "If you'd take away my boys, there would be nothing left in my foundry worth working for." His is the type of organization in the smaller community where the entire burden of selecting and training new workers falls upon the manager; he is the type of man who enjoys working with young men more than with things, and he is able therefore to enter and influence their lives even in their play time.

Many other communities are following the lead started by Milwaukee so successfully over 20 years ago, and since developed into the most comprehensive and successful system in the United States. Even yet, with 905 indentured apprentices in various mechanical trades, the supply of skilled workers from this source is hardly half the number continually needed. The fundamental ideas are cooperation of the employers through a metal trades association, chamber of commerce, or some other similar organization, looking toward uniformity of shop train-

ing, rates of pay, and (if necessary) interchange of apprentices in order to round out the experience. Essential mental training of from four to eight hours weekly is arranged by the public school system. Proper coordination of school and shop work cannot be neglected.

#### System Used in Nine Centers

In at least nine industrial centers such a system for machine shop and foundry apprentices is in successful operation. Details vary with the local necessities. The cost generally is shared by the employing plants (in the form of wages paid), the public school system (through funds for continuation schooling) and by the United States Government. Returns to the student are very great. It has been computed that the added pay which a well trained mechanic receives above that of an ordinary one is the equivalent to interest on a \$12,000 investment. To the community the advantage is greatest in keeping a young man from acquiring vicious or idle habits during the two years between the age of 16, when his compulsory education is finished and 18, the minimum age which most compensation laws permit his employment in regular work.

Before any success may be attained in apprentice training, the managers of the industry or group of industries, must be thoroughly awake to the desirability of replacing the natural mortality in skilled workers with younger men, trained not only in the manual trade, but of considerable intelligence and loyalty to the community.

#### Mechanical Handling of Materials

**F**OUR papers on materials handling in the foundry were read at a session devoted exclusively to this subject. The attendance was small, but those present showed keen interest. L. L. Anthes, managing director Anthes Foundry, Ltd., Toronto, Ont., was chairman.

In a paper on "Materials Handling and Its Relationship to Building Plans," E. F. Scott, engineer of layout, design and equipment of foundries for the Austin Co., Cleveland, went into details regarding the layouts for the varying conditions of foundry plant development. Yard handling, charging, hot metal transportation, mold conveying, sand handling and distribution, return of flasks, etc., to the molding machine, conveying cores, shakeout, knockout, conveying of castings to the cleaning room all demand some sort of material handling, said Mr. Scott, and he pointed out the best available methods for these foundry operations.

Some interesting data on the results that may be expected from the installation of mechanical handling equipment in the foundry



Amount That May Be Spent for Each \$1 per Ton Reduction in Cost, Using 20 Per Cent per Year Fixed Charges

Annual Earning in Percentage	Annual Production in Tons									
	1,000	2,000	3,000	5,000	10,000	20,000	30,000	40,000	50,000	60,000
100	\$833	\$1,660	\$2,493	\$4,165	\$8,330	\$16,660	\$24,990	\$33,320	\$41,650	\$49,980
50	1,428	2,856	4,284	7,140	14,280	28,560	42,840	57,120	71,400	85,680
33 1/3	1,875	3,750	5,625	9,375	18,750	37,500	56,250	75,000	93,750	112,500
25	2,222	4,444	6,666	11,110	22,220	44,440	66,660	88,880	111,100	133,320
20	2,500	5,000	7,500	12,500	25,000	50,000	75,000	100,000	125,000	150,000

were given by J. J. Hartley, engineer Link-Belt Co., Chicago. The most startling economies have been made in the "continuous process" foundries, Mr. Hartley said, but by proceeding with discretion and sound judgment the "intermittent foundries" have successfully applied materials handling equipment and have also effected savings. Definite methods of computing the economies of labor-saving equipment have been worked out by the materials handling division of the American Society of Mechanical Engineers, but Mr. Hartley suggested the accompanying table for determining the amount that may be spent for each \$1 per ton reduction in cost, using 20 per cent per year fixed charges.

#### Jobbing Foundry Can Save by Mechanical Handling

IN his paper on "What Materials Handling Equipment Can Do for the Jobbing Foundry," W. B. Marshall, sales engineer Chain Belt Co., Milwaukee, gave the following specific experiences in support of his contention that jobbing foundries can reduce costs by the correct application of materials handling equipment:

"A jobbing steel foundry, after installing for its central sand conditioning unit materials handling equipment consisting of elevators, overhead sand bins and electric lift trucks for distributing sand to the molders, accomplished direct labor savings amounting to over \$10,000, the sand handling labor having been reduced from 120 hr. to 59 hr. per working day. Two 10-hr. shifts of six men each were formerly required. Now, five men working days only, plus 3 hr. for three men on the night shift, is all that is necessary. In other words, this has meant a saving of \$2 per ton of castings produced.

"This same saving has been accomplished in other foundries and it is conservative to assume that at least 15 per cent per ton of sand handled can be saved by the use of materials handling equipment.

"In another instance the problem was of a different nature and increase in capacity was secured in the existing plant by the application of suitable sand handling equipment and production was increased 300 per cent. This was made possible by providing an overhead supply of sand for the molding machines, shakeout con-

veyors and a central sand conditioning unit."

#### Adaptability of Electric Trucks

"THE Application of the Electric Truck to Materials Handling in the Foundry" was the subject developed by Harold J. Dorus and C. S. Schroeder of the Yale & Towne Mfg. Co., Stamford, Conn. The value of the electric truck lies in its ability to reduce costs of operation, said the authors, who pointed out specific examples of such savings. In several foundries a relatively new use for the electric industrial truck has been found in carrying melted metal from the cupola to the molding floor. In one malleable foundry four electric industrial charging trucks carry 2500 tons of boxes and castings over a period of 24 hr. The haul varies from 80 to 300 ft., and the loads vary from

3000 to 4000 lb. each. In another annealing furnace, having a capacity of 36 tons, it has been found that the furnace may be unloaded by one truck and one driver in 1 hr. and loaded in 3/4 hr., or a total of 1 1/4 hr. per charge carrying the pots approximately 600 ft. This represents 21 tons per hour for one truck.

In the discussion it was pointed out that a danger of mechanization is a too complete reliance on the equipment. Representatives of equipment manufacturers stressed the necessity of the human element and of not making the mistake of assuming that even the most automatic equipment does not require constant watchfulness. The humanitarian aspect of mechanization of foundries was also emphasized as a means of taking some of the drudgery out of foundry work.

## No Royal Road to Malleable Iron

ONE technical session on malleable iron founding was held under the chairmanship of F. M. Robbins, Ross-Meehan Foundries, Chattanooga, Tenn. A round-table discussion at luncheon (which lasted until late in the afternoon), under the direction of F. L. Wolf, Ohio Brass Co., Mansfield, Ohio, brought the technologists again together for informal chat over production problems.

WHILE the round-table meeting was not reported, it is understood that a valuable interchange of opinion was had on such problems as the effect of small amounts of alloy in white cast iron, the cause and correction of brittle malleable, the short annealing cycle reported from some quarters, and duplex melting with cupola and electric furnaces.

#### Oxidation Phenomena

A PAPER, interpreting Dr. Schenck's exhaustive investigations, recently published in Germany, which developed a series of curves showing the relationship among temperature, carbon, oxygen, and iron, was prepared by H. A. Schwartz, National Malleable & Steel Casting Co., Cleveland, Ohio. Much iron and steel metallurgy is condensed into these diagrams; within certain areas representing particular temperatures and CO:CO<sub>2</sub> ratios, iron ore is reduced to iron, as in a blast furnace; under other temperatures and gas concentrations the opposite reaction occurs. Other fields in the diagram represent case carburization. Mr. Schwartz pointed

out that the surface conditions on malleable iron destined for high-speed machining or threading operations are of the utmost importance.

The foundryman must avoid a surface of decarbonized iron, and also a steely surface with undecomposed iron carbide. This means that the atmosphere of gases in the annealing pots, in contact with the castings, must be maintained within fairly narrow limits, and fortunately iron silicate is a substance which keeps this balance correct automatically. It was brought out that air furnace slag is a good raw material for packing, far better than roll scale.

#### Gas-Tight Annealing Boxes

W. R. BEAN, president Grindle Fuel Equipment Co., formerly with the Eastern Malleable Iron Co., said the latter company had abandoned scale filling for annealing boxes ten years ago. In his opinion, temperature variations during the annealing cycle are responsible for much more unsatisfactory iron than are chemical variations in the cast iron itself,



and for this reason hand firing of furnaces is being abandoned. Mr. Schwartz said that if white iron castings are placed in an empty, gas-tight box, the reactions between the enclosed air and hot iron are such that a satisfactory anneal and surface will result, but emphasized that brickwork or muffles are by no means gas tight in the above sense.

#### Effects of Various Elements

**L.** E. GILMORE, of Crane Co., Chicago, in a paper on the "Effect of Various Elements on Malleable Cast Iron," after recounting the specific effects of each

of the common elements, all the rest being constant for the time being, emphasized the view that malleable iron should be thought of, not so much as an alloy in which each element has a fixed and individual function, but more as a mixture of compounds and interacting elements which, when properly balanced with each other, will produce the highest quality iron. It is in the manner in which the elements unite in compounds and the relative proportions of certain elements as well as the total percentage of any one element that determines the degree of success in producing good malleable castings.

## Brass Foundrymen Discuss Melting

**O**NLY one session was devoted to non-ferrous foundry subjects. It was presided over by G. H. Clamer. Five papers were scheduled and in part are briefly reviewed below. A round table luncheon, under the leadership of N. K. B. Patch, secretary Lumen Bearing Co., Buffalo, attracted close to 100. Many phases of brass foundry problems were informally discussed.

**I**N a paper entitled "Science in the Foundry," E. F. Hess, Ohio Injector Co., Wadsworth, Ohio, emphasized the thought that scientific control and persistent research could be done in any foundry, even without a staff of special workers. Rather it required a certain desire on the part of all the principal employees to find out the way to do things right. Such an attitude of mind would quickly lead the melting department to adopt ingot metal rather than compound alloys from virgin metal because it makes for uniformity in castings, reduces the number of analyses thought to be necessary, and also cuts down the inventory.

Control of pouring temperature is another essential in order to get the largest number of molds from one pot, none poured either too hot or too cold. One man should do this work in order to reduce the chances of personal error. Sand control gives good dividends on a small investment. One man working over the various heaps during the night is sufficient for a moderate sized foundry. Correlation of the various records is also necessary in order that they may be interpreted by the manager.

#### Furnace Lining

"Refractories for Brass Foundry Furnaces," by H. M. St. John, metallurgist Detroit Lubricator Co., Detroit, contained some data in addition to the report of a committee presented in September, 1926. A number of firms had reported the average life of furnace linings. When classified according to types of furnace it was found that in each group will be found a half dozen or more plants which get from two to three times the general average number of heats. In part this is due to more continuous operation, but in oil or gas crucible furnaces, open flame fur-

naces, and indirect-arc furnaces the following important factors also contribute to a high average:

1. Preheat thoroughly.
2. Glaze lining before using first time.
3. Inspect daily and hot patch.
4. Cold patch weekly.
5. Use a mild cleaner, or a slice bar in careful hands to remove accumulated slag.

Some discussion about carborundum brought out that its conductivity did not cause irregularities in electric furnace operation, as might be suspected. Red brass is likely to pick up enough silicon from carborundum to cause unsound castings, but the low zinc alloys containing lead and tin do not react in this manner with carborundum. Mr. St. John also emphasized that many good refractories are spoiled by the bond used, which contracts, cracks, and allows

penetration of metal and general derangement of the lining.

#### Overheated Aluminum Alloys

It is the general impression that metals should not be greatly overheated, although many alloys show no deterioration if cooled to the correct temperature before pouring. In a paper on the "Effect of Melting and Pouring Conditions Upon the Quality of No. 12 Aluminum Alloy Sand Castings," T. W. Bossert, Technical Direction Bureau, Aluminum Co. of America, New Kensington, Pa., said that high melting temperature, or long soaking increases the grain size in the casting, even when poured from a proper temperature. Increasing the pouring temperature causes even more coarsening. This effect also exists in the aluminum-silicon casting alloys now so much used. Fortunately, however, if such overheated metal is merely cast into ingots and remelted at a correct temperature the proper fine grained structure is restored, and the detrimental effects, which formerly caused drawing and cracking, are removed.

#### Lead in Complex Brass

O. W. Ellis, Westinghouse Electric & Mfg. Co., East Pittsburgh, investigated "The Effects of Lead on the Properties of a Complex Brass"—a yellow brass containing iron, manganese, aluminum and tin. Lead percentages from zero to 3.5 were studied. As little as 0.04 per cent could easily be seen in the microstructure, and had pronounced effects on the fracture; this result is at variance with certain French authors who claim that nearly 1 per cent of lead can be taken into solid solution. Mr. Ellis concludes that while such leady brasses are of some value, a lead-free brass has the best physical properties, especially for cold rolling, and where high strength and good ductility are desired.

## Report of A. F. A. Committee on International Relations

**D**URING the past winter this committee has been engaged mainly on preliminary arrangements for the Third International Foundrymen's congress which will be held in London, June 11 to 15, 1929, under the auspices of the Institute of British Foundrymen. The first International Foundrymen's congress was held in Paris in September, 1923; the second was held in Detroit in September, 1926.

The plans, which have now been agreed upon, provide for the American delegation leaving New York about May 15, 1929, in order to arrive in England in time for a three weeks' preconvention tour of England and Scotland, which will include several days in London prior to the opening of the Third

International Congress on Tuesday, June 11.

On the preconvention tour such important British foundry centers as Birmingham, Manchester, Glasgow, Newcastle, Sheffield and Derby will be visited. Elaborate arrangements will be made by the different branches of the Institute of British Foundrymen for the entertainment of the visiting foundrymen from overseas on this tour.

The program will include plant inspections and many sightseeing excursions. The latter will include points of great historic interest such as Warwick Castle, Shuttery, Stratford-on-Avon, Guys Cliffe, Kenilworth Castle, Loch Lomond, Scotch Highlands, the Dukeries,

## Chairmen of Cupola Practice Meetings



DR. RICHARD MOLDENKE



H. W. DIETERT



E. J. LOWRY

Haddon Hall, Windsor Castle, etc. After the international congress, various continental postconvention tours are contemplated.

The details of the preconvention tour can be obtained from H. Cole Estep, chairman.

During the week of the congress itself in London, what is expected to be the largest exhibition of foundry and shop equipment ever held in Europe will be staged under the auspices of the prominent British foundrymen's organizations. At the sessions of the congress, papers will be read and discussed by some of the

world's most prominent foundrymen. The committee on international relations of the A. F. A. expects that at least 200 American foundrymen will attend.

The committee on international relations now consists of H. Cole Estep, Penton Publishing Co., chairman; L. L. Anthes, Anthes Foundry, Ltd.; G. H. Clamer, Ajax Metal Co.; Vincent Delport, Penton Publishing Co., Ltd.; Stanley G. Flagg, Jr., Stanley G. Flagg Co.; and Verne E. Minich, American Foundry Equipment Co. The personnel of the committee will be considerably enlarged during the next few months.

## New and Improved Equipment at Foundry Exposition

**T**HIS exhibit, which has taken on the proportions of a local industrial exposition, is in itself a striking object lesson in the foundry progress that has marked the past 11 years in the United States. Last year at Cleveland, in what was considered a remarkable showing of the appliances and equipment of the modern foundry, 40 firms were represented. This week's exhibition at Philadelphia has no less than 70 firms. . . . To one who attended the meeting of 1896 the evolution into the conditions of the present convention is simply amazing.—From *The Iron Age* of May 23, 1907. Foundry progress in the 21 years since was clearly emphasized by the exhibition last week, a brief general account of which follows:

**S**EVERAL new and many definitely improved forms of equipment for all departments of the foundry were to be seen at the exposition held last week at the Commercial Museum, Philadelphia. With more than 240 companies, each showing a number of products, for the most part in operation and supplemented in many cases by cut-away views, moving pictures and detail plans of actual installations, there was enough of interest to warrant more than one visit during the week of the convention.

The great progress made in the development of foundry equipment

since the 1907 Philadelphia convention and exposition, the report of which is quoted in part above, undoubtedly was impressive to those who could recall the earlier exhibits. On the whole, this progress has been perhaps more or less gradual, until today time and labor saving devices for the foundry are not only more numerous but the equipment is being built to high standards of design. Machine tool standards are being followed and ball and roller bearings, steel cut gears and automatic lubrication are being extensively employed. Frames are of strong and of rigid design, bearings are

thoroughly protected from dust and dirt, and facility of operating control is a major consideration.

Some of the new and improved equipment at this year's exposition is reviewed below:

### Improved Mold and Core Making Equipment

**M**OLDING machines of more than 15 companies were on view. In addition to recent models of sand straddler molding machines, portable roll-over jolt equipment, and a jolt stripper with adjustable stripping pins, one company featured a working installation of a continuous molding unit. The system included sand treating and sand and mold handling equipment, and molds were made at the rate of one a minute. The conveyor was arranged to handle comparatively small squeezer molds, alternating with drags and copes of medium size. Of interest also was the provision for power handling of the cope and closing the larger size mold.

Another exhibit that attracted attention included a 13 x 18-in. multiple-molding machine making molds for pipe fittings, the cope and drag being made at the same time. This machine has an electric pattern heater. It is rammed by velocity and the drag pattern is drawn by return. The cope draw is by a central plunger, air and oil operated, the yoke being also air and oil operated. The same company had in operation a shockless jarring roll-over and pattern drawing molding machine equipped with new air clamps and air wedges, and a new four-point suspension equalizing device, all of which are intended to increase production by saving steps and eliminating lost motion.

Air-operated jolt, clamp, leveller, roll-over and pattern draw were features of a new jolt roll-over machine shown by another company. No clamps or wedges are required for the roll-over operation, and no unclamping nor leveling of the bottom board is required for the draw. The machine has two-roll-over cylinders and one oil cylinder for controlling the roll-over operation. An improved base-type jarring machine, with automatic lubrication, was shown by another well known builder. Another large exhibit included portable and stationary squeeze strip machines with a 14-in. squeeze cylinder. Provision is made for pattern draw and flask lift and automatic vibrators are employed.

Jolt squeezers with a cast steel squeeze head which swings horizontally and may be readily adjusted up or down to the proper height to require a minimum amount of air to make the mold was another new machine. Other companies showed stationary and portable jolt squeezers of late design. A large motive type Sandslinger on jobbing work and tractor type Sandslinger making molds with stripping plate ma-



chines were centers of interest. The "Sandblower," a compressed air sand-ramming machine of German design, also attracted attention. There was also a working demonstration of the making of gray iron castings in permanent molds, a small electric furnace being used in conjunction with a single head hand-operated permanent molding machine.

#### Core Making Machines

**A**MONG core making machines was a new hinged roll-over unit exhibited by a large builder of molding machines. This machine, said to cut machine time 38 per cent and increase production correspondingly, has no clamps to handle, no leveling device to lock or unlock and requires no foot work. The standard machine is for core boxes up to 14 in. wide, 24 in. long, 7 in. deep and with 4-in. draw. It can also be had for boxes up to 16 in. wide, with 8-in. draw. A rockover type core machine with 12 x 16-in. table, 8-in. pattern draw, and accommodating a core box and bottom plate 10 in. high was featured by another company.

A rollover core machine, with air jolt, shown by another molding machine manufacturer, has a 14 x 14-in. table and a draw of 8 in. The jolt cylinder is 3 in. in diameter.

A new machine for grinding cores was a feature of the exhibit of a manufacturer of core knock-out machines, shakeout bales, etc. This unit is said to be the first standard core grinder shown at these exhibits. It employs a 12-in. cup wheel, which is driven by a ½-hp. electric motor, the wheel and motor being mounted on overhead ways and arranged to travel 3 ft. longitudinally. The cores to be ground are placed in fixtures mounted on the bed of the machine.

#### Large Showing of Materials Handling Equipment

**M**ATERIALS handling equipment, consisting of cranes, hoists, overhead track systems and switches, mold conveyors, belt conveyors and elevators for sand, cupola charging machines, hot metal carrying and pouring devices, overhead chain conveyors, industrial trucks and trailers, and accessory equipment, was again an outstanding feature. More than 25 companies were represented, and the equipment shown was for the most part under power.

Industrial trucks, included electric and gas-powered elevating platform, crane and other types. One company exhibited a new "sand digger," which is equipped with a hopper bucket and scoops, lifts and carries its load of sand, ashes or other material. The machine carries 9-ft. buckets on low and high lifts, and is adapted for foundry clean-up work. The load can be scraped up, elevated and dumped over the side of a motor truck or a gondola car. Another company showed a special oven



J. J. HARTLEY



E. F. SCOTT

#### Contributors to the Materials Handling Program

charger, and others, special trailers for foundry use.

Among a number of new items announced by one company was an electric ladle-pouring device with push-button control on the handle of the ladle, the operating triggers directly under the fingers of the man who pours. Unusually smooth up and down movements is a feature of the device. The same company exhibited a chain-driven overhead conveyor for the first time, as well as a new overhead trolley track of special section, having a 3-in. flange at the top and a 2-in. flange at the bottom. Of interest also was a new trussed crane with span of 36 ft. 10 in., capacity 2000 lb., which may be pushed by one man. The device combines maximum strength with minimum weight, and is intended to supplement the larger electric cranes. Push-button pouring devices and turntable pouring were also shown by other companies. Crane trolleys with herringbone gears and roller bearings was a new feature of one large equipment maker.

Something of the history of electric hoist development was to be noted from one of the older manufacturers of this equipment, who had on exhibition five electric hoists, the first of which was developed in 1889.

#### Sand Blast Equipment

**I**NDIVIDUAL exhibits of sand blast equipment were large. An unnamed cascading blast mill unit, featuring quick loading and unloading, less than 1 min. for each operation, was a center of interest at one booth. The device consists of an inclosed apron conveyor that travels from front to back. One thousand or more pounds of castings may be cascaded continuously into position in front of the three nozzles. At the conclusion of the operation the conveyor travel is reversed and the load fed out on to an unloading belt or into a receptacle. Other new equipment shown by the same company included an oscillating pan "down-draft" room with rotary table.

An automatic continuous-operating rotary sand blast table, 18 ft. in diameter, said to be one of the largest of its type, shown by another company, was a center of interest. This new equipment, available also with 12-ft. table, is for small work in large quantities or for large single pieces such as sinks, bath tub bases, etc. It employs a blast unit of direct pressure type.

Tumbling mills of improved design were exhibited, and a number of companies exhibited abrasives for the cleaning of castings and forgings.

New sand preparing machinery included a portable unit which cuts, screens and piles foundry sand in heaps. The same company introduced improved gas-driven and electric-driven sand cutters. A variety of sand sifting, riddling and conditioning equipment for core and molding rooms was demonstrated by several companies. One of these was a counterflow screen, for material from 6-in. opening to 300-mesh; operating on the rotary principle. The screen is operated by eccentrics which give it rotary motion, vibrating the screen both horizontally and vertically. It is stated that this action not only cuts the sand, but cleans the screen as well. An improved core and facing sand mixer, with tapered roller bearings, speed-reducer drive and hexagonal screen, improvements said to result in much higher speed, was shown by another company.

#### Cupolas and Blowing Equipment

**O**NE new cupola, with a heavy bottom plate of boiler plate and structural shapes, to eliminate cracking and distortion, was exhibited. Other improvements included wrought steel cylindrical columns filled with concrete and a safety opening of fusible lead plate which is tightly clamped in a vertical position so that it will not become covered with coke, etc.

Cupola blowers with characteristics that permit the use of a blast gate and control board so that the



blast gate may be controlled to deliver a constant weight of air to the cupola irrespective of atmospheric conditions or resistance through the cupola was a new item of this year's exposition.

A preheated blast cupola arrangement and a continuous melt cupola were shown in blueprint form by one company. The preheated blast arrangement is intended to economize coke and increase the melting ratio. Roller bearing cupola blowers were demonstrated by another company.

Electric furnace exhibits included units for steel, gray iron, copper, brass and bronze melting. Core ovens of a variety of sizes and types, including drawer, rack, continuous, tower and other types of core ovens were demonstrated by several companies.

Exhibits of woodworking machines for pattern and flask work featured a number of recent models. Sanders, saw tables, band saws, planers, borers, pattern lathes and jointers were among the 17 tools shown by one company, an inside sander being the newest item.

Sand testing and control equipment, optical and other types of pyrometers, microscopes, photomicrographic apparatus, hardness, transverse and other physical testing equipment were exhibited.

#### Pneumatic and Electric Tools

**D**ISPLAYS of pneumatic tools were, as in previous years, attractive. Several companies were represented and late models of all types of equipment, including sand rammers, core breakers, hammers, chippers, riveters, grinders, drills and sanders, were demonstrated. Air hoists were shown, and compressors of various types were under power. Portable electric drills, tappers, screw drivers, nut setters, grinders and sanders, including high-frequency tools, and flexible shaft equipment were also on display.

Grinding and snagging equipment was exhibited by several companies. High speed swing frame grinders and snagging stands, in one case operating at wheel speeds of 9000 ft. per min., were centers of interest.

Welding and cutting equipment was demonstrated by three companies and an improved special sprue cutting band saw for soft metals was shown by another. Apparatus which, in melting, atomizing and applying coatings of any of the commercial metals on metal surfaces, may be regarded as a "putting-on" tool, was a center of interest. Paint spray equipment was shown at another booth.

Several manufacturers of flasks, pouring jackets and similar equipment were represented and there were working demonstrations of shakeout apparatus by other companies.

Lubricating devices, including automatic systems, were demonstrated by two companies. The application of automatic lubrication from a central point on over-

head cranes was a feature of one exhibit.

Companies supplying pig iron, alloys, coke, fluxes, refractories, molding, core and blast sands, facing and parting materials, core oils and core binders and other raw material were represented.

#### Large Educational Exhibit of Castings

**A**N exhibit sponsored by the A. F. A. and intended to show the engineering possibilities of gray iron, malleable and steel castings was a center of interest. The steel exhibit was gathered through the efforts of the Steel Founders' Society of America and the malleable exhibit was secured by the Malleable Iron Research Institute.

Among the gray iron exhibits, which were collected by a special committee of the A. F. A., were specimens showing the possibilities through the use of nickel. There were automotive cylinder castings of intricate design, and intricate small parts made possible by the fluidity of the iron. A number of ornamental castings showing possibilities as to finish were also to be seen. Passenger car air brake equipment, including a universal valve requiring 133 cores, each cored passage being subjected to 165-lb. air pressure, were among other cast iron displays.

Malleable iron exhibits included castings for automotive and railroad use. A water base formerly made up of five castings was shown and there were a number of specimens illustrating the ductility of malleable iron. Machinability was demonstrated in malleable iron clutch castings and other pieces. Of interest was a malleable iron casting of 5/8-in. section which had a 1 1/2-in. hole in the center, the hole having been drifted from a 3/4-in. punch hole. Another casting, 1/2 in. thick, had a number of 5/8-in. cold punched holes, the distance between the punched holes being, in some cases, 1/4 in., no sign of fracture being shown.

## The Course in Cupola Operation

**A**MONG the best attended sessions were those on cupola operation. The time of each of the four sessions was set at 4 p. m. and they lasted over two hours, were extremely lively and interesting and the value derived was such that doubtless a considerable extension will be given these practical discussions in future conventions.

Dr. Richard Moldenke presided over the first meeting and introduced the subject of the cupola melting process by outlining the principles involved. He explained the combustion of coke and the heat generated by means of two diagrams, the first showing the interior of a slagging-producer in colors, under heat—this being in effect a cupola charged with coke only. The second diagram showed the location of the metal as

The steel exhibit contained a number of interesting castings, some of very intricate design. A cast steel combination chain sheave and gear served to illustrate the accuracy obtainable in castings of this nature. Good surface appearance and uniformity of metal was shown in a cast steel automobile headlight bracket. A cast steel hub, on which 10 machining operations are performed and in which even minute defects are objectionable, was also of interest. Another exhibit was a cast steel gear housing, formerly made of several parts, but now cast as a single piece to eliminate machining and assembling operations.

Steel hitch castings, used in a trailer hitch, were a center of interest. This piece, formerly built up of steel shapes, wood blocks, etc., comprised 54 parts. The steel castings now employed eliminate machine work and minimize assembly. The castings are of thin section, which reduce the weight.

Another exhibit was a baggage truck wheel which has replaced a similar wheel made up of 77 pieces that required 119 machining operations. Use of the steel casting has eliminated all assembly work and reduced machining from 119 to four operations. A cast steel dipper stick for an excavator was shown as an illustration of the replacement of a number of assembled parts by a single casting. A cast steel crawler side frame for a steam shovel, another casting shown, was said to have replaced 350 welded and riveted parts, eliminating assembly costs and permitting marked reduction in machining costs. Another exhibit was a one-piece cast steel boom which replaced an assembled boom made up of 35 pieces of plates, angles and castings and which required 376 rivets. The steel casting was featured as eliminating loose joints, repair parts and adjustments, and as being lighter and stronger than the built-up boom.

charged into the zone of maximum temperature of such a slagging producer, making it the cupola operation. The desired objectives of cupola melting were next explained and how these are best attained, with many practical points on successful cupola melting.

In the general discussion which followed, a wide range of subjects was touched upon, questions of uniform layering of the charges, the desirability of small charges, extent of the melting zone, cutting of the lining, the advantages of bucket charging for mechanical operation, and many other matters came in for a thorough analysis. Over 250 members of the convention attended each of these sessions.

The second session was in charge of E. J. Lowry, who outlined the cupola construction details which must be watched by

the foundryman for successful operation. He discussed the installation of blast pipes and tuyeres, height of charging door and other details.

The discussion went far into the subject of upper and lower tuyeres, the shape of tuyeres, oblique versus straight drop mechanical charging, blast preheating with successful developments and also failures. In these discussions, the foundrymen present gave their difficulties and much interchange of information and advice for overcoming troubles resulted.

The third session, under the chairmanship of David McLain, was opened by the presentation of a paper by him describing the ideal method of charging a 42-in. cupola. The complete sequence of operations was fully gone into, and later discussed at greater length. Many problems in the correction of defective work were brought up, most of them hinging on working with too low a bed and giving oxidized iron.

The final session, in charge of H. W. Dietert, was on cupola improvement. This consisted of a series of papers, or presentation of new cupola developments. The first was the description of the Vial Hot Blast Cupola, presented by F. K. Vial, Griffin Wheel Co., Chicago. This has been described in *THE IRON AGE*, Oct. 20 and 27, 1927. The discussion brought out a number of details as well as the present status of the use of these cupolas in daily work. From 165 down to 135 lb. of coke per ton of iron melted is the record of achievement.

The second paper was presented by Nat. Skelly, on the somewhat phenomenal results in melting in the ordinary way obtained at the Maytag Foundries. Considering that 1 to 16 down to 1 to 14 for the fuel ratio is claimed, a stormy discussion ensued. This brought out some pertinent reasons for the figures in question, in that the sprues are charged at about 800 deg. Fahr., the melting done very low in the bed with a probable

oxidation of much silicon and heat thus derived. Nevertheless there was brought out the fact that, by careful supervision of every phase of the charging and melting operation, a very economical process resulted.

The next paper was by Dr. Fritz Meyer, who presented the results of the powdered-coal fired cupola—that is supplementing the coke used by adding powdered coal (burned in external combustion chambers) by way of the tuyeres. This paper was also very interesting, the claim being 120 lb. fuel per ton of iron melted. Much discussion ensued, notably on the temperatures produced.

Mr. Dietert then gave some curves showing that the velocity of the gases passing through the melting zone affected the melting rate. Mr. Skelly also gave the diameters of tap-holes for different melting rates. This concluded the cupola operation course and showed also that preheated air cupolas have come to stay.

## CHICAGO'S INDUSTRIAL MUSEUM

### Reconstructed Fine Arts Building of 1893 World's Fair to Be Used

**A**N industrial museum, occupying 400,000 sq. ft. of floor space, is to be located in the Fine Arts Building, Jackson Park, Chicago. This building, having a total floor space of 7 acres, was erected in 1893, at the time of the Columbian World's Fair. Notwithstanding that it was of a more permanent character than most buildings erected for similar purposes, it will require \$5,000,000 to rehabilitate it. This sum has been provided by a bond issue voted by the South Park commissioners. Julius Rosenwald, chairman board of directors, Sears, Roebuck & Co., Chicago, is sponsor for the industrial museum, which has been incorporated as the Rosenwald Industrial Museum. Through his generosity a sum of not less than \$3,000,000 has been made available for the purpose of purchasing, building and installing exhibits.

The South Park commissioners estimate that it will require two years to reconstruct the building, which consists of a center portion and two wings. In order to make use of the basement it will be necessary to raise the main floor. The height of the ceiling in the main section will be reduced by building in it a second floor. Much of the structural steel work and the brick walls will be retained. The exterior finish, which originally was done in plaster, will now be overlaid with either limestone or marble.

Mr. Rosenwald, after making a study of industrial museums in Europe, has determined on a course in installing exhibits which will show the effects upon, and the progress made by, civilization through the invention, use and development of mechanical devices.

Replicas will be used where originals cannot be obtained. It is hoped that many originals of developments made wholly or in part in this country will be made available through the cooperation of American industries. Where possible, exhibits will be full size, supplemented by panoramas, in an effort to tell a complete story. Many models will be set up to be operated by push buttons that will be accessible to visitors.

Waldemar Kaempffert, at present scientific editor, *New York Times*, has been appointed executive director. As plans for the museum take more definite form, the directors will consult leaders in each of the various fields to be covered. The plan is to call on one man actually engaged in a given industry and also some academic man who is interested in the same field. These men will cooperate with the board of directors in laying plans and shaping the exhibit for that industry. This museum is being given the support of the Commercial Club of Chicago. The board of directors is as follows:

William Rufus Abbott, president Illinois Bell Telephone Co.; Sewell L. Avery, president United States Gypsum Co.; Edward F. Carry, president Pullman Co.; Rufus C. Dawes; T. E. Donnelley, president R. R. Donnelley & Sons Co.; John V. Farwell, chairman J. V. Farwell Co.; Robert P. Lamont, vice-president American Steel Foundries; Charles H. Markham, chairman Illinois Central Railroad; Charles Piez, chairman Link-Belt Co.; Theodore W. Robinson, vice-president Illinois Steel Co.; Julius Rosenwald, chairman Sears, Roebuck & Co.; Joseph T. Ryerson, president Joseph T. Ryerson & Son, Inc.; Albert A. Sprague, director Sprague, Warner & Co.; Robert W. Stewart, chairman Standard Oil Co. of Indiana; Harold H. Swift, vice-president Swift & Co.; Charles H. Thorne; Frank O. Wetmore, chairman First National Bank of Chicago, and Leo F. Wormser.



The Center Portion of the Field Columbian Museum, Remaining from the World's Fair at Chicago in 1893, Will House the Rosenwald Industrial Museum. An auditorium, to be located in one wing, will seat 4500. Photograph copyrighted by A. M. McGregor, Chicago.

# Piercing Billets for Making Tubes

Rounds of a Few Sizes, Small Rather Than Large,  
Advocated for Plug-Mill Process—Expanding  
Mills for Extending Range of Tube Sizes

THE automatic or plug mill process of making seamless tubes was discussed at length at the Pittsburgh meeting of the American Society of Mechanical Engineers, May 14-17. Comparisons were made with the pilger process but the paper which was the subject of the discussion was devoted almost wholly to the plug mill system and argued for a small range of sizes of round billets, perhaps three or four, and small rather than large, for the whole range of sizes of seamless tubes. The paper was contributed by R. C. Stiefel and George A. Pugh, both of the Aetna Standard Engineering Co., Ellwood City, Pa. It was an unusually lucid explanation of the design of piercing mills and covered recent developments in the use of expanding mills calculated to produce the seamless product up to 24 in. in diameter. Generous extracts from the paper are given in the following, together with various points developed in the general discussion:

## Pilger and Plug Mill Processes Compared

The pilger process is in use chiefly in Europe and the automatic or plug-mill process chiefly in the United States. Experience with both processes has established the following comparable economic features between the two methods:

- 1 The output in tons with the plug-mill process is two or three times more than with the pilger process.
- 2 The cost of installation is about the same for either process or is rather less for the plug-mill process.
- 3 The cost of tool equipment, such as rolls and mandrels, is several times greater with the pilger process than with the plug-mill process.
- 4 Rolls and mandrels must be of the best grade of alloy steel in the pilger process, and in the plug-mill process they are of similar composition to those used in other steel working methods.
- 5 Maintenance of plant and tool equipment is much less costly and more simple with the plug-rolling method than with the pilger method.
- 6 The quality of the tube produced with reference to evenness of wall thickness and smoothness of outside and inside surface is better and more uniformly reliable with the plug rolling process than with the pilger process.
- 7 Tube lengths obtained with the pilger process are currently 40 ft. to 60 ft., and exceptionally up to 80 ft. or 90 ft. With the plug-rolling process, lengths obtained today are 30 ft. to 40 ft.; with slight modifica-

tion of the heretofore usual equipment, it will be possible to produce 50-ft. lengths.

8 The largest tubes produced with the pilger method are 20 in. in diameter and with the plug-mill process about 14 in. diameter. A recent development (expanding) will permit the production of 24 in. diameter and larger with the plug-rolling method.

## Modern Plug-Mill Unit

In the typical modern plug-mill steel billets are charged into the piercing-mill furnaces, and from there into piercing machine *A* or piercing machine *B*, either of which can be operated as a piercer, or the first piercer for piercing only and the second piercer for enlarging the pierced billet.

From either of the piercing machines the billet is conveyed to the plug mill *C*. Here the billet is passed through the rolls two or more times for the purpose of reducing wall thickness and elongating it. All of the movements of the billet are performed mechanically on the plug mill with practically no hand labor.

From the plug mill the tube is conveyed to either of the reeling machines *D*, in which it is acted upon by oblique rolls on the outside and a cylindrical mandrel on the inside, for the purpose of equalizing the wall thickness and smoothing its outside and inside surfaces. In the reeling operation the diameter of the tube is slightly increased, resulting from a slight reduction of the wall thickness.

After the reeling operation, the tube is passed through the sizing machine *E* for the purpose of reducing it to the required diameter. This machine usually contains several pairs of grooved rolls. The tube, after leaving the sizing machine, is shifted on to a conventional type of cooling table consisting of a number of slowly moving conveying chains, rolling the tubes on a slightly inclined table.

## Advocates Using Smallest Possible Billets

Referring to Fig. 2, it will be understood that the piercing mandrel over which the billet is forced explores, so to say, the inside of the solid billet on its full length for defects. An annular outside volume of the solid billet, represented in dotted lines, equal to the volume of the pierced billet, has remained unexplored by the mandrel. Any defect *d* in the explored section *S* of the solid billet, in the shape of what is commonly called a lamination, resulting from a blow hole in the ingot

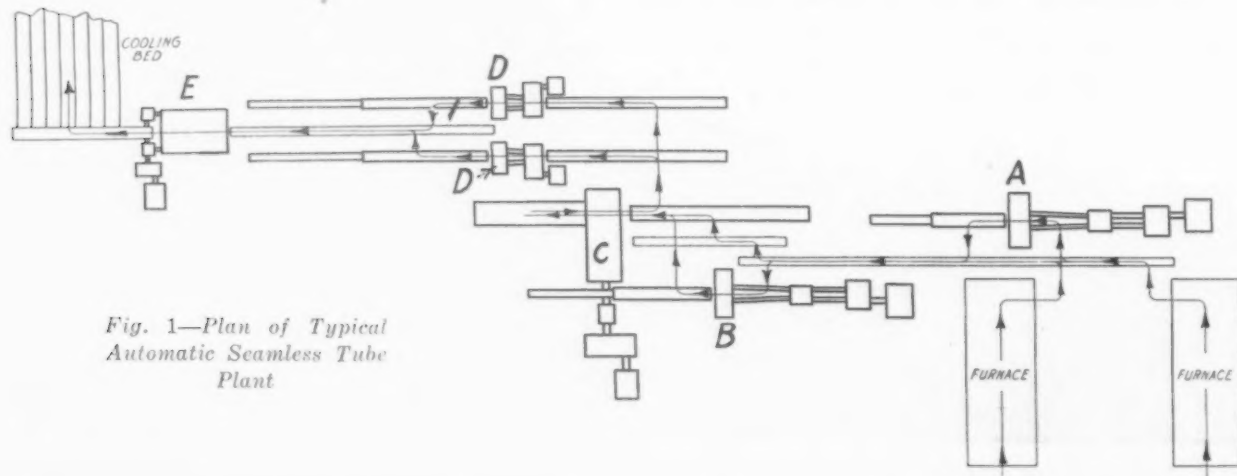


Fig. 1—Plan of Typical Automatic Seamless Tube Plant



from which the billet was rolled, is laid out or exposed on the inside surface of the pierced billet in the shape of a tear, seam, or lap, while any such lamination  $l$  existing in the unexplored annular section of the solid billet will remain practically undisturbed in about the same relative location in the annular section of the pierced billet. Therefore, the smaller the unexplored section is in relation to the full section of the solid billet, the fewer such laminations may be contained in the displaced central volume of the billet and consequently fewer or no tears, seams, or laps may be obtained on the inside of the pierced billet.

This condition again points in the direction of using as small a solid billet as possible for the production of a given size tube.

#### Design of Piercing Pass

Until lately there has been no good and reliable procedure established to determine the most favorable size of solid billet from which to produce a given size tube; it has been largely a matter of "rule of thumb." A common practice was to choose a solid billet of a diameter approximately the same, or somewhat smaller, than the desired tube. The correct method to determine the most favorable size of solid billet is as follows:

The piercing diagram illustrated in Fig. 3 is arranged in such a manner that the converging pass  $CA$  formed between the rolls establishes enough grip on the billet, by the time the latter has progressed to point  $D$ , to force it over the point of the mandrel. The

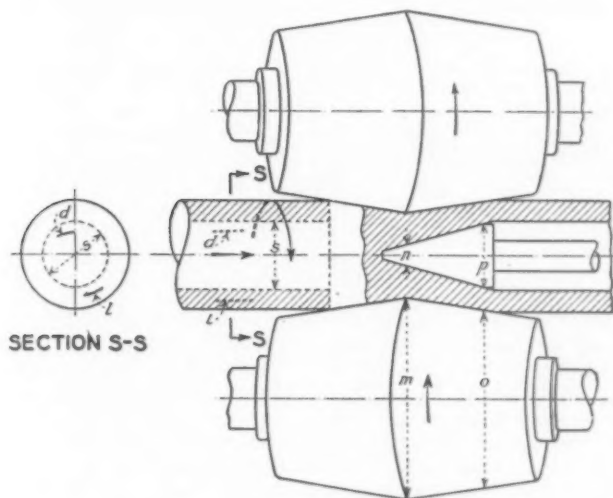


FIG. 2

elongation of the billet, that is, the reduction of its cross-sectional area, should be done only in the converging pass from  $C$  to  $A$  with a minimum draft or reduction of the billet. The diverging pass, from  $A$  to  $B$ , between the rolls and the mandrel is arranged so that the cross-sectional area of the billet at  $A$  is equal to that at  $B$ . In a piercing pass established to fill these conditions, the billet is subjected to expansion only in the diverging pass and to elongation in the converging pass.

It will be clear from a closer study of Fig. 3 that the metal of the billet has a fair chance to flow lengthwise (or the billet has a chance to elongate) in the converging pass, where it is gripped between the two roll faces forming a comparatively large included angle  $a$  between them. But where the metal is gripped between the two diverging roll faces and the two corresponding mandrel faces, it becomes almost impossible for it to flow lengthwise between the respective roll and mandrel faces which form a smaller flow angle  $g$  for the metal than is the case in the converging pass.

On the other hand, it is evident from the cross-section at  $yy$  of Fig. 3 that the flow angle in the transverse direction is greater than in the longitudinal direction, from which it follows that in the diverging pass the metal meets less resistance to flow in the transverse direction (expansion) than in the longitudinal direction (elongation). From this analysis it becomes clear that the diverging pass should logically be determined, as described, so as to compel expansion, and no elongation of the billet, instead of by using a

mandrel the shape of which is determined by guess work.

#### Function of Piercing Rolls

It will be noted from Fig. 3 that, at the first contact  $C$  established between the billet and the rolls, the diameter of the roll is small while the billet is large; as the billet progresses from  $C$  to  $A$ , the diameter or circumference of the billet decreases while that of the

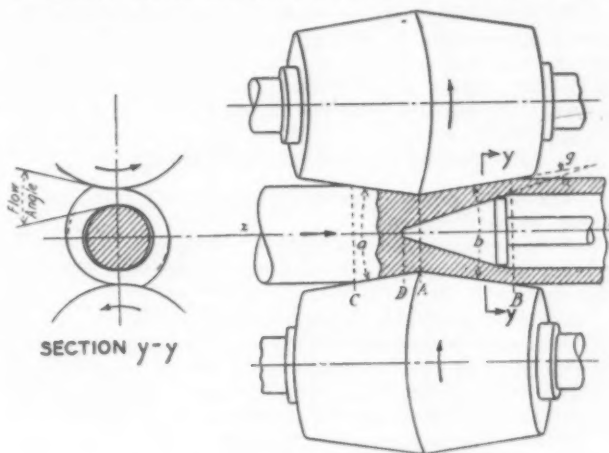


FIG. 3

roll increases; from  $A$  to  $B$  the reverse takes place, that is, the diameter or circumference of the billet increases while the corresponding diameter or circumference of the rolls decreases.

This irrational relation between corresponding diameters, and consequently speeds, of the rolls and billets at different contact points during the progress of the billet through the piercing pass, results in the setting up of the injurious stresses in the billet heretofore referred to; it also results in the breaking up of the center of the billet before it reaches the point of the mandrel, thereby favoring the penetration of the mandrel into the center of the billet; but it also has the effect of producing enormous friction or slippage between the rolls and the billet on the outside as well as between the mandrel and the billet on the inside. When considering that the metal pressure exerted by the rolls on the billet may amount to several hundred thousand pounds, it will be evident at once that much slippage under such great pressure will result in enormous waste of power.

#### Function of Piercing Mandrel

The peculiar functioning of the mandrel in the pass of the now customary piercing machine also greatly contributes to the setting up of injurious stresses in the

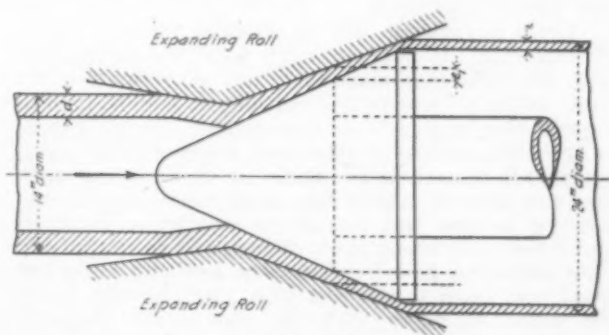


FIG. 4

billet. Referring to Fig. 2, it is apparent that the rolls, being obliquely disposed in relation to the axis of the billet or pass, tend to rotate the billet and feed it forward over the mandrel. The axis of the billet and the axis of the mandrel being the same, it is clear that the mandrel has no forward feeding effect on the billet; the billet therefore is fed or pulled or pushed forward on the outside by the rolls while the mandrel on the inside tends to prevent it from moving forward.

Furthermore, it will be noted that to the large diameter  $m$  (Fig. 2) of the roll is opposed the small diameter  $n$  of the mandrel, while to the small diameter

o of the roll is opposed the large diameter  $p$  of the mandrel. The torsion and slippage stresses to which the outside of the billet is subjected by the speed differences of the rolls, as explained before, are therefore being repeated for the same reasons on the inside by speed differences of the mandrel. All this occurs under the heavy pressure on the metal necessary to displace it from under the contacting surfaces between it and the rolls and mandrel.

What has been stated heretofore with reference to power absorption by slippage or friction by the rolls on the outside of the billet, also applies in connection with the similar great friction or slippage occurring between the mandrel and the inside of the billet.

#### Piercing Power and Small Billets

The total power necessary in piercing consists of three main divisions:

- 1 Power absorbed by machine friction
- 2 Power absorbed by roll and mandrel friction on the metal
- 3 Power absorbed by metal displacement.

A careful analysis of the three power divisions would probably prove that, in many cases, the power absorbed by roll and mandrel friction on the metal is far greater than the power absorbed by actual metal displacement.

From the foregoing it becomes evident that the power required in piercing is of injurious character to the steel and that the amount of power required to produce a tube of a given size in a given time represents the measure of punishment imparted to the billet.

The tendency, therefore, should be to reduce the power in piercing to a minimum in the manner described and rather spend a little more power in the bar mill to produce billets of smaller diameter, the additional bar-mill power required being of a beneficial character to the steel, refining it to a higher degree. Thus a three-fold advantage will be obtained; better steel, less power consumption, and less punishment of the steel in piercing.

The conclusion should not be drawn that these difficulties are constant and standing in the way of producing seamless tubes as cheap or cheaper than lap-welded tubes. Good yields, varying between 80 per cent and 90 per cent from solid billet to finished tube, are now being obtained when producing lengths of about 30 ft. to 35 ft., which is a creditable result when considering crop-end losses and about 3 per cent furnace loss.

#### Expanding for Tubes as Large as 24 In.

Another inconvenience inherent in the now usual seamless plants lies in the fact that, when it is necessary to change production from one size of tube to another, considerable time, five hours or more, is lost in making the necessary shift in the machine equipment and size of solid billet.

Great advantages can be obtained in this respect by replacing the now commonly used reeling machine with an expanding machine, which may function the same as the present reeling machine or may be used to expand the tubular body coming from the plug mill, or from the piercing machine, into larger sizes of correspondingly thinner walls. Sufficient experimental work has been done to justify the assumption that this expanding method will permit the production of large size tubes up to about 24 in. diameter at comparatively little additional power requirement and with an initial plant cost equal to the cost of a plant for the direct production of tubes with the now usual plug-mill process up to about 14 in. diameter. Allowance for additional cost of larger finishing equipment will, of course, have to be made.

The benefits obtained from the expanding mill will become evident by a study of Fig. 4. A tubular body of 14 in. diameter and wall thickness  $d$ , coming from the plug mill or from the piercing mill, is expanded to 24 in. diameter of corresponding wall thickness  $e$ . If a tube of less than 24 in. diameter should be required, for instance, of a diameter as shown by dotted line, it could be produced without changing the setting of the rolls of the expanding mills by simply using a smaller expanding mandrel, as shown by dotted lines. This smaller tube, however, would have a wall thick-

ness  $e_1$ , in the same proportion greater than  $e$  as its diameter is less than 24 in. Should the wall thickness of the smaller tube have to be less than  $e_1$ , then it could be obtained by simply preparing a tubular body at the plug mill or piercing mill of the same diameter (14 in.), but of correspondingly less wall thickness than  $d$ . On the other hand, if the wall thickness  $e_1$  should be required to be greater than shown, then the wall of the entering tube would have to be correspondingly greater than that shown and designated by  $d$ .

#### Wide Range in Sizes from Few Sizes of Billets

The same advantages with reference to simplification in the production of different sizes which are described in the foregoing grouping of sizes from 14 in. to 24 in. obtain when grouping other sizes as, for instance, all sizes from 8-in. to 14-in. diameter and all sizes from 5-in. to 8-in. diameter.

It must be noted here that the indicated division of all sizes of tubes from 5 in. to 24 in. in diameter into only three groups, each to be produced from only three different tubular bodies of constant diameters, was given as an illustration only, and that it will be advisable to arrange the working program for more than only three groups in order to obtain the best possible

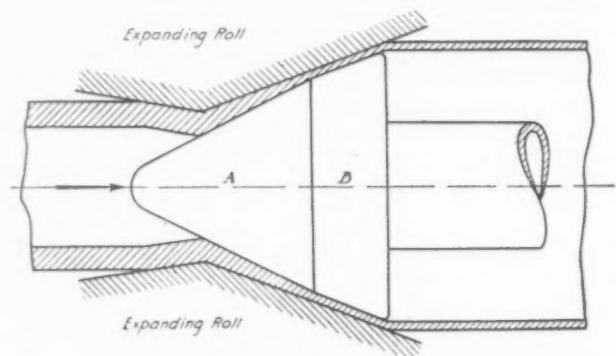


FIG. 5

piercing condition for one size of tube of each group and not too much deviation from the best piercing conditions for all the other sizes of each group.

This great flexibility in sizes obtainable from an entering tube of constant diameter dispenses with changes of guide and roll settings at the plug mill and at the piercing mill. The variation required in the wall thickness  $d$  of the entering tubular body can be obtained at the plug mill and piercing mill by a simple change of mandrels. At the expanding mill a change in the setting of the outlet guides would be required to accommodate the varying diameters from 14 in. to 24 in. of the outgoing tubes, but no change of the inlet guides would be required, the entering tube being of constant diameter. Changes in the settings of the reeling machine and sizing machine would have to be made in the same way as in the present installations.

Referring to Fig. 5, a modification of Fig. 4, the expanding mandrel is provided with two different cones A and B. Cone A forms a converging pass for the entering tube wall between it and the expanding rolls, and cone B forms a parallel pass for the tube wall between it and the expanding rolls. On cone A, the entering tubular body has its wall reduced and its diameter enlarged, and on cone B the wall is smoothed out in exactly the same manner as is now the case in the customary reeling machine. By the use of this modified mandrel, the expanding and reeling operations may be performed simultaneously in the thus-formed expanding-reeling pass. The expanding method referred to forms the subject of United States patents.

#### Output, Cost and Quality

The output in a modern plug-mill plant in tubes of 5 in. diameter and larger is about 200,000 tons per year.

The cost of production of seamless tubes of usual sizes is the same as, or less than, that of lap-welded tubes. Inasmuch as the seamless-tube industry is comparatively new, it is reasonable to assume that



more progress will be made with reference to cost of production.

The method of manufacturing seamless tubes permits the use of high-carbon steel or alloy steel, resulting in a product of superior quality, with reference to strength and usage. It is also applicable to other metals, such as copper, brass, aluminum, etc., all of which are impossible by the welding process.

**Better Steel Needed for Automatic Process**

Among those who discussed the Stiefel-Pugh paper at length was J. B. Wharton, Standard seamless tube plant of Spang, Chalfont & Co., Economy, Pa. He said in part:

"For the pilger process cast round ingots are used. The ingots are always considerably larger than the finished tube to be made. These ingots are reheated and pierced with a heavy wall. The inside diameter of the pierced blank is approximately the same as will be the inside diameter of the finished tube. The outside diameter, however, is 3 to 4 in. larger than will be that of the finished tube. The pierced blank is then forged down in the pilger mill to the desired outside diameter. This operation tends to forge out and cover up any defects developed in the piercing operation.

"For the automatic mill process, rolled rounds are used. The diameter of the round is much smaller than the finished tube. The initial piercing is with a heavy wall comparable to the pierced blank for the pilger mill. The diameter of the pierced blank is still much smaller than the finished tube. In the second piercing operations the pierced blank is expanded 30 to 40 per cent in diameter, elongated 50 to 100 per cent and wall thickness reduced to a thickness of about 50 per cent greater than the finished tube. The second piercing operation therefore not only aggravates any defects developed in the first piercing operation, but uncovers others which may have been in the steel and not brought out in the first piercing.

"As opposed to a reduction in diameter in the pilger process, there is an expansion in diameter in the automatic mill process. It would therefore seem clear that a better quality of steel is required for the automatic process than for the pilger.

"We have been able to secure very consistent results on the power required to expand a pierced billet. The calculation was the power required to displace a given volume of metal per second. The table shows that the number of kilowatts per cubic inch of metal displaced per second varies from 11.5 to 14.2. This result is reasonably close when we consider the fact that no attempt was made at temperature control, other than the furnaceman's judgment."

**Comparison with Lapwelded Tube Conditions**

H. H. Murray, superintendent Babcock & Wilcox Co., Beaver Falls, Pa., also discussed the paper. "The authors state," said he, "that the difficulties experienced in seamless tube manufacture should not lead us to draw the conclusion that seamless tubes cannot be

produced as cheaply or cheaper than lapwelded tubes. All of us who manufacture seamless tubes are looking forward to the time when this will be accomplished, but at the moment, excepting perhaps a few individual cases, this has not generally been the case. Most of the seamless tube mills at present in existence were designed to take care of a more or less general business of varying sizes and types of tubes, whereas lapweld mills as a rule, due largely to the enormous requirements of the oil industry, are built to give a maximum output on a narrow margin of sizes processed in large quantities. When hesitancy of capital has been overcome, perhaps we may have seamless mills built along these latter lines. When that time comes, we should be well able to meet the lapweld man on his own ground."

**Ingots Cast for Piercing**

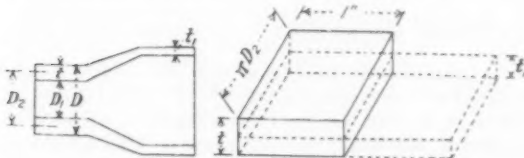
W. M. Selkirk, chief engineer, Pittsburgh Steel Products Co., said that cast steel ingots pierced with heavy walls have been used in Germany in connection with the plug mill but this involves as many as 18 passes in the plug mill and also reheating and the sawing off of the rolled billets between certain passes in order to produce hot finished tubes of commercial size and quality—a procedure not considered economical in the United States.

"It is apparent from the paper," said he, "that a pierced billet with a much heavier wall would be necessary for the production of all classes of seamless tubes—a condition favorable to the use of cast ingots for the plug as well as the pilger mill. A great deal of equipment could be eliminated, especially with the pilger process." Tubes over 130 ft. in length have been produced in the pilger process in this country, he added, and while he admitted these display certain economies in the matter of scrap losses, reduced cropping, etc., the commercial value of such lengths was questionable in the light of handling and transporting difficulties.

An investigation of freight rates in the Chicago switching district opened May 15 at Chicago before J. B. Campbell, chairman of the Interstate Commerce Commission. The present hearings, which have extended into this week, cover I. C. C. Docket 19610, which provides for a general investigation of Chicago district switching rates, and also I. C. C. Docket 2900, under which the commission suspended an advance in rates published by the railroads. These tariffs called for a rate of 3c. per 100 lb. for a one-line haul, and 3½c. for a two-line haul, and 4c. for three or more. The old rates are 2c., 2½c. and 3c., respectively.

In a proposed report by Examiner W. M. Carney to the Interstate Commerce Commission it is held that rates on spelter, in carloads, from points in Arkansas, Oklahoma, Missouri and Kansas to Newport, Ky., are not unreasonable, but are unduly prejudicial to the extent they exceed the rates to Chicago, which are 11c. per 100 lb. lower.

*Determination, as Explained by J. B. Wharton, of Amount of Power Required to Displace Metal in Piercing Operation*



The volume of metal displaced per unit of feed of billet is equal to

$$\frac{\pi}{4}(D^2 - D_1^2) - \pi D_1 t_1$$

The table gives the results of the observed power for the cases cited.

Size of finished pipe, in...	9	9½	11½	13½
Pierced billet:				
Weight, lb.....	1345	1060	1712	1825
Outside dia., in.....	7½	7½	9	10½
Wall, in.....	1½	1½	1½	2½
Area, sq. in.....	27.1	29.99	37.65	62.84
Mean dia., in.....	5½	5½	7½	8
Mean circum., in.....	18.06	18.45	23.17	25.13
Expanded billet:				
Outside dia., in.....	9½	10½	12	13½
Wall, in.....	½	½	¾	¾
Mean circum., pierced billet and thickness exp. billet.....	12.4	12.7	20.4	18.9
Displaced metal per in. length pierced billet..	14.7	17.29	17.25	44.04
Feeding speed, in. per sec.	12.35	7.50	9.4	4.8
Displacement, cu. in. per sec. ....	182	130	162	212
Total kilowatts.....	2100	1850	2250	2600
Kw. per cu. in. per sec....	11.5	14.2	13.9	12.3
Angularity of rolls, deg...	10	11	10	10



# Supply Associations May Combine

Manufacturers' and Two Distributers' Organizations Approve Consolidation Plan at Nashville Convention—"Business at a Profit" Slogan of Meeting

**A**CTION leading toward consolidation of the National Supply and Machinery Distributers Association, the Southern Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association, was taken at the joint convention of these organizations at the Hotel Hermitage, Nashville, Tenn., May 15, 16 and 17. A committee of nine, consisting of three representatives from each of the three associations, will confer within a short time to see if it is possible to work out an arrangement whereby a common secretariat can be established and the activities heretofore carried on separately can be coordinated.

The unusually large attendance testified to the interest of the mill supply industry in the striking slogan of the convention, "Business at a profit rather than profitless prosperity," and the sessions were planned so as to give ample opportunity for discussion of this subject. The convention consisted of separate business meetings of each association as well as joint sessions. At the latter the union of the associations was the main topic.

To consider plans for consolidation, the American Supply and Machinery Manufacturers' Association appointed a committee the members of which are D. S. Brisbin, Columbus-McKinnon Chain Co., Columbus, Ohio; J. Harvey Williams, J. H. Williams & Co., Buffalo, and S. P. Browning, Ohio Valley Pulley Works, Maysville, Ky. This committee will confer with a similar group from the National Supply and Machinery Distributers' Association, consisting of E. P. Welles, Charles H. Besly & Co., Chicago; George Puchta, Queen City Supply Co., Cincinnati, and H. W. Strong, Strong,

Carlisle & Hammond Co., Cleveland, and a group from the Southern Supply and Machinery Dealers' Association, composed of D. D. Peden, Peden Iron & Steel Co., Houston, Tex.; W. W. Doe, Alabama Machinery & Supply Co., Montgomery, Ala., and T. C. Keeling, Nashville Machine & Supply Co., Nashville.

Proposals for amalgamation were first made by the American Supply and Machinery Manufacturers' Association, which extended invitations to the other two associations to join with it in the formation of a new body to take the place of the three existing organizations. If the committees from the associations agree upon a plan for a union, each of the bodies will conduct a referendum vote of its members to ascertain whether a majority is in favor of consolidation.

## Remedial Trust Legislation Favored

Declaring that the present administration and interpretation of the Sherman and Clayton anti-trust laws operate in such manner as to prohibit competitors from entering into agreements and exchanges of information, regardless of the reasonableness thereof, the three associations adopted resolutions urging Congress to pass remedial legislation giving equal weight to the interests of capital and labor with that of the consumer. To bring attention of members of Congress to this situation, committees from each of the three associations were named.

At the first joint session of the convention, E. P. Welles, president of the Mill Supply Council, related the history of that organization and told about its activities in the past year.

## "Business at a Profit" and Maintenance of Resale Prices

**A**T the opening of the twenty-third annual convention of the National Supply and Machinery Distributers' Association, President E. P. Welles reviewed the history of the association. In his annual presidential address he stated that a repetition of the unsatisfactory business conditions in 1927 could be avoided by members insisting upon dealer distribution, by the suggestion and maintenance of resale prices by manufacturers with a spread sufficient to cover modern cost of distribution, by determination to have business at a profit and by members following the association's national program for 1928.

The tendency of some manufacturers to place their lines with numerous distributors, and particularly with those engaged in other businesses, such as plumbing supply houses, pipe jobbers and hardware retailers, was deplored by George A. Fernley, secretary-treasurer, in his annual report. Mr. Fernley emphasized the fact that manufacturers are giving more serious thought to the prosperity of the distributor and are urging industrial users to make purchases through him.

Among the topics discussed by Mr. Fernley were the Mill Supply Council, National Wholesale Conference, overhead expense reports, local and sectional associations, direct competition of manufacturers with

distributers, resale price legislation, price cutting, overstock and goods wanted bulletins, simplification, collection bureau of the association, inadequate margins of profit allowed distributors, tax reduction, keeping salesmen informed of price changes, analyses of costs and sales, inventory discrepancies or concealed losses and motor truck deliveries.

During the past year the association added 35 new members.

## Average Distribution Cost 22.54 Per Cent

Accomplishments of the association were set forth in a brochure distributed at the convention. In the brochure is a summary of overhead expense reports of members for the past six years. This shows that in 1927 the average expense was 22.54 per cent, the average gross margin 22.83 per cent and the average turnover 4.13 times. Turnover has risen gradually and consistently to that figure from 3.52 times in 1924. The brochure also contains the 1928 platform of the association. In regard to salesmen, the platform states that "we believe it is an erroneous policy for the distributor to give salesmen cost figures or to permit salesmen to make prices. All selling prices should be determined by a responsible executive in the house

and no deviation from such selling prices should be made, except with the consent of the sales manager."

Statistics prove that it is impossible to distribute goods on a margin of 12 or 15 per cent, declared B. H. Ackles, Rayl Co., Detroit, in discussing "business at a profit rather than profitless prosperity." The only way to make the manufacturer realize this fact is through educational work on the part of each individual member cooperating with the association. H. O. Wentworth, Vulcan Copper & Supply Co., Cincinnati, in a paper suggested that the slogan of distributors should be "business at a profit or no business at all." He likewise stressed the point that operating for volume and cutthroat competition are synonymous. He cited the fact that expense sheets of the past three years, tabulated by the association's office, show a net profit for the distributor of less than 0.5 per cent. This situation can be corrected by arriving at an average basis of selling prices that will meet the present-day cost of doing business plus a further allowance representing a profit at the end of the year. Much can be done by the distributors to bring about this correction, but in six or eight lines an adjustment is dependent upon manufacturers. Here the desired results can best be accomplished by urging manufacturers to fix consumers' resale prices on their products. The same procedure followed by the bolt and nut makers should be followed in drills, files, taps, wrenches, cap and set screws and other commodities.

#### Knowledge of Costs Necessary for Profits

Distributors can conduct their businesses so as to get maximum profits by having an exact knowledge of the cost of doing business, by keeping a careful check of general expenses and by proper cooperation from all departments or divisions of the company, stated P. O. Boylan, W. M. Pattison Supply Co., Cleveland. Mr. Boylan said that every order must carry a profit and that the setting of a low price does not mean good service and does not insure a repeat order. He de-

clared that "where the low-priced house has one chance for business, the house insisting on a profit commensurate with the service given has nine."

From a local point of view, asserted A. E. Douglas, E. A. Kinsey Co., Cincinnati, simplification of the following lines would be beneficial by enabling the company to carry a smaller inventory: machinists' tools, pipe threading tools, goggles, drill chucks, abrasive wheels, paper and cloth disks. In fact, these are but a few of the lines which should be simplified. While simplification will reduce burden in stock carrying, if sales are affected, resulting in loss of profit, caution should be exercised. Mr. Douglas stated that standardization means the elimination of variety, which is one of the most potent selling arguments. He said that the solution for simplification is for each distributor to have an arrangement with his source of supply whereby items in his line may be returned for credit or exchange for items which will move more rapidly.

Benefits of simplification were listed by Lawrence G. Puchta, vice-president Queen City Supply Co., Cincinnati, in a paper read at the convention, while W. A. Slack, president Torchweld Equipment Co., Chicago, brought out the value of a one-price policy.

#### E. P. Welles Reelected President

E. P. Welles was reelected president of the association, while H. H. Kuhn, Hardware & Supply Co., Akron, Ohio, will serve as first vice-president, and H. E. Ruhf, Cleveland Tool & Supply Co., Cleveland, as second vice-president. Members elected to the executive committee were T. E. Hazell, William H. Taylor & Co., Allentown, Pa.; Arthur Yorke, Hanson & Yorke Co., Inc., Scarsdale, N. Y.; Charles E. Allinger, Charles A. Strelinger Co., Detroit, and William Todd, Jr., Somers, Fittler & Todd Co., Pittsburgh. In addition, E. B. Hunn, C. S. Mersick & Co., New Haven, Conn., and Louis A. Clark, Samuel Harris & Co., Chicago, will serve on the committee, their terms not expiring until next year.

## Uniform Accounting for Distributors Recommended

"A SCIENTIFIC and uniform accounting system is the common language by which we can discuss our problems and measure our proficiencies and deficiencies," stated T. C. Keeling, in his annual address as president of the Southern Supply and Machinery Dealers' Association. Having put into operation a modern system of accounting, the dealer must next seek to interpret the data it reveals. Mr. Keeling emphasized the fact that laws governing the cost of distribution in the mill supply industry have not been formulated, and that "we have all acted blindly on the assumption that costs will decrease, or at least remain stationary, as volume increases. There are good reasons for believing that it is a fallacy when applied to all units, regardless of their volume of sales. If it be true, how can we account for the fact that overhead expenses of all companies reporting for the Southern and the National associations have been steadily climbing year after year, when commodity prices in general have been decreasing?"

Mr. Keeling stated the principle that distribution costs are a function of the volume of goods produced, and the greater the volume the greater will be the unit cost of distribution. He further declared that distributors must prove conclusively to manufacturers that the latter can get their goods into the hands of consumers at the lowest possible costs by distributing solely through distributors.

"As long as we suffer from a feeling that price, and price only, will secure us business, and that any effort, worthy or unworthy, made to get this business is a proper way to get it, just so long should we refrain from any criticism of manufacturers who sell direct and do not protect the distributors, or from criticism of other distributors who may enter our field and meet the conditions created by us," stated the executive com-

mittee, of which L. J. Larzelere, Farquhar Machinery Co., Jacksonville, Fla., is chairman, in its annual report.

#### Unprofitable Sales Should Not Be Made

The executive committee asserted that "more important even than the establishment of a resale price and the adherence to it is the determination to refuse to make a sale that does not carry a decent margin of profit." It indorsed the stand taken by the United States Chamber of Commerce in regard to national tax relief, and expressed the opinion that members of Congress do not realize that the great mass of business in this country is composed of small corporations. The committee deplored the fact that railroads serving the South have announced a policy of cancelling all less-than-carload commodity rates, substituting higher rates.

Alvin M. Smith, Smith-Courtney Co., Richmond, Va., secretary-treasurer of the association, referred in his annual report to the district meetings held during the past year at Huntington, W. Va., Nashville, Memphis, New Orleans, Dallas, Birmingham, Charlotte, N. C., and Jacksonville, Fla. He declared that, while 1927 was not a particularly good year in either volume of sales or extent of profits, it could have been much better if manufacturers and distributors had made the proper effort to secure a living margin of profit. He said that "it is just as easy to get a profit as it is not to get one, and when our practice is to indulge in 'fear-mindedness' and, wherever we can find the opportunity, to cut below the other fellow's price, it is time for us to retire from business." Mr. Smith also discussed the increased freight rates put into effect by Southern railroads, the functions of a trade association, relations with manufacturers and other association activities.

W. W. Doe was elected president of the Southern association. Officers who will serve with him are D. D.



Peden, first vice-president; C. J. Salm, Dixie Mill Supply Co., Inc., New Orleans, second vice-president; T. C. Keeling, chairman of the executive committee; L. J. Larzelere, Philip Pidgeon, Pidgeon-Thomas Iron Co.,

Inc., Memphis; C. W. Beckner, West Virginia-Kentucky Hardware & Supply Co., Huntington, W. Va., and W. M. Given, Young & Van Supply Co., Birmingham, members of the executive committee.

## Manufacturers Reiterate Belief in Distribution by Dealers

ROBERT B. SKINNER, Skinner Chuck Co., New Britain, Conn., in his message as president of the American Supply and Machinery Manufacturers' Association, called attention of the members to the report on "The Mill Supply Situation" of the delegates of the organization to the Mill Supply Council. This report already had been approved by the association's executive committee and advisory board. It pointed out that the council in its meetings had established a code of business ethics, had induced the National Supply and Machinery Distributors' Association to abolish its manufacturer membership and had received assurance from the American Supply and Machinery Manufacturers' Association that it would drop from its roster those members who have not expressed themselves as favoring distribution of mill supplies through dealers, wherever possible. Incidentally, the National Supply and Machinery Distributors' Association and the Southern Supply and Machinery Dealers' Association voted at the convention to discontinue the practice of accepting manufacturers as associate members, this policy to become effective May 31. At the same time they reiterated the belief that the association should continue to

indicate "by deed as well as by word our sincere belief in dealer distribution and our function to lend all aid possible to that result, but on a basis of nothing less than absolute equality." It is as a result of this stand taken by the association that it proposed a United Mill Supplies Association to take the place of the three present associations.

### Dixon C. Williams Chosen President

At the annual election Dixon C. Williams, Chicago Nipple Mfg. Co., Chicago, was chosen president. Other officers to serve the coming year are S. P. Browning, Ohio Valley Pulley Works, Maysville, Ky., first vice-president; C. O. Drayton, Graton & Knight Co., Worcester, Mass., second vice-president; B. F. Ruether, Mechanical Rubber Co., Cleveland, third vice-president; W. C. Allen, Black & Decker Co., chairman executive committee; David C. Jones, Lunkenheimer Co., Cincinnati; K. G. Merrill, M. B. Skinner Co., Chicago; Eugene Grant, Dodge Mfg. Co., Mishawaka, Ind., and K. W. Atkins, E. C. Atkins & Co., Inc., Indianapolis, members of the executive committee.

## STEEL TREATERS ELECT

### Officers and Executive Committees Are Named by Several Chapters

F. F. Lucas, Bell Telephone Laboratories, Inc., New York, has been elected chairman of the New York chapter of the American Society for Steel Treating. E. C. Bain, Union Carbide & Carbon Corporation, has been named vice-chairman, and T. N. Holden, E. W. Bliss Co., secretary-treasurer. The new executive committee is as follows: J. J. Crowe, Air Reduction Sales Co.; J. B. Romer, Babcock & Wilcox Co.; F. C. Langenberg, Climax Molybdenum Co.; F. B. Coyle, International Nickel Co.; E. P. Gaffney, Crucible Steel Co. of America; J. T. Wyzalek, Hyatt Roller Bearing Co., and Gordon Bell, Central Alloy Steel Corporation.

#### Chicago Chapter

A. M. Steever, metallurgical engineer Great Lakes Forge Co., Chicago, has been elected chairman of the Chicago chapter, and Donald Colwell, metallurgist Stewart Die Casting Co., will serve as vice-chairman. J. A. Comstock, assistant metallurgist People's Gas, Light & Coke Co., continues as secretary-treasurer. Those elected to serve on the executive committee are Ray Mau, district manager Vanadium Alloy Steel Co.; W. A. Scheuch, metallurgist Western Electric Co., Inc.; Harry Hardwicke, vice-president Atlas Steel Corporation; F. R. Jeffries, superintendent of heat treating for Templeton Kenly, Ltd.; E. J. Gossett, president Bell & Gossett Co., and A. T. Clarage, president Columbia Tool Steel Co.

#### Detroit Chapter

The Detroit chapter has named the following officers: F. P. Zimmerli, metallurgist Barnes-Gibson-Raymond, Inc., chairman; C. Upthegrove, associate professor of metallurgy University of Michigan, vice-chairman, and Joseph G. Gagnon, metallurgist Hudson Motor Car Co., secretary-treasurer. The executive committee is made up of E. J. Hergenroether, metallurgist Cadillac Motor Car Co.; A. L. Grinnell, district representative General Alloys, Inc.; H. O. Lang, sales engineer Halcomb Steel Co.; J. W. Robinson, sales engineer Higgins-Bothwell Co.; E. H. Stillwell, metallurgist Dodge Brothers, Inc.; E. C. Wahl, district representative Leeds & Northrup Co.; F. C. Young, metallurgist Ford Motor Co.; Charles Foreman, metallurgist

Buick Motor Car Co., Flint, Mich.; Gordon A. Stumpf, metallurgist Reo Motor Car Co., Lansing, Mich., and Leo L. Vasold, metallurgist Willys-Overland Co., Toledo, Ohio. These men will take office at the annual outing to be held June 9.

#### Rochester, N. Y.

C. F. Wattel has been named chairman of the Rochester, N. Y., chapter; E. S. Roscoe, vice-chairman, and I. C. Matthews, secretary-treasurer. These men, together with G. E. VanVechten, F. W. Arvine, H. J. LeClaire, C. E. Codd, R. F. Kimber and D. I. Harrison, will serve on the executive committee.

#### Golden Gate Chapter

At a meeting of the Golden Gate chapter held on May 9 at the Athens Athletic Club, Oakland, Cal., Dr. W. J. Crook was elected chairman for the coming year. Clyde Williams was named vice-chairman and H. E. Morse secretary-treasurer. The following executive committee was elected: C. Hawley, G. E. Batten, J. S. Fowler, D. H. Grubb, W. Grothe, Ivan Johnson, H. J. F. Niemann, E. E. Fess, J. V. Coulter, S. H. Edwards, C. M. Henderson and J. R. Gearheart.

The meeting, which was held jointly with the American Welding Society, was also the occasion of talks on the selection of automotive steels, by Edgar E. Jamison; on the selection of tool steels, by S. H. Edwards, and on the selection of methods for steel castings, by Ivan Johnson. K. V. Laird presented an illustrated paper on "Welds at High Temperatures."

#### Syracuse Chapter

At the annual meeting of the Syracuse, N. Y., chapter, held on May 8, J. J. Driscoll, Crucible Steel Co. of America, was elected chairman; S. P. Peskowitz, Halcomb Steel Co., vice-chairman, and K. J. MacKenzie, Brown-Lipe-Chapin Co., secretary-treasurer. W. R. Frazer, Halcomb Steel Co.; C. B. Smith, Crucible Steel Co. of America; Earl Houghton, Brown Lipe Gear Co.; William F. McNally, New Process Gear Corporation, and R. L. Manier, Syracuse Lighting Co., were chosen members of the executive committee.

Orders for electric hoists during April, according to reports by members of the Electric Hoist Manufacturers' Association, decreased 29.44 per cent as compared with the previous month. The value of such orders decreased 23.91 per cent as compared with March and shipments were 11.73 per cent less.



# Valleys Seek Ohio River Outlet

Youngstown Steel Makers Say P., L. & W. Extensions  
Would Open Ohio Valley Markets and Lower  
Freight Rates on Incoming Coal

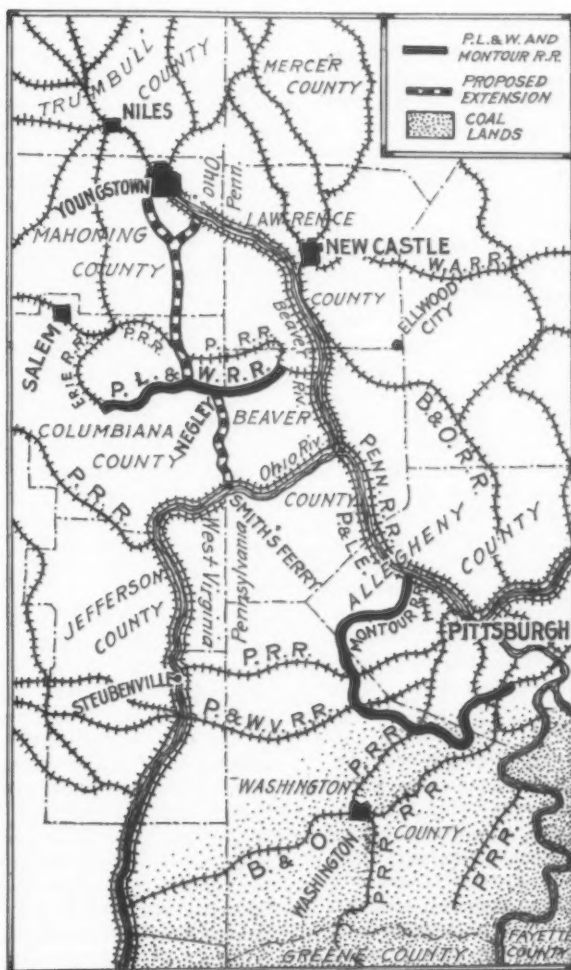
WASHINGTON, May 22.—Iron and steel interests of the Mahoning and Shenango Valleys are awaiting with interest the outcome of the application of the Pittsburgh, Lisbon & Western Railroad to construct two branch lines which would connect the Valleys with water transportation through the Ohio River. Hearings on the application before C. V. Burnside, assistant traffic director of the Interstate Commerce Commission, were concluded last Thursday. The hearings also covered an application of the Montour Railroad, a subsidiary of the Pittsburgh Coal Co., to acquire control of the P., L. & W. stock.

## Trunk Line Carriers Oppose Plan

Opposition to the proposed construction was offered by Trunk Line carriers, including the Baltimore & Ohio, the Pittsburgh & Lake Erie and the Pennsylvania. Counsel for these lines contended that the proposed branches would not be in the public interest and would not further public convenience as required by the Transportation Act, under which the applications were made. It was argued that the Trunk Lines already have ample capacity to meet the requirements of the Valleys, and it was implied that the desired river-and-rail service would be given by the P. & L. E. through connection at Monaca, Pa., on the Ohio River, and by the Pennsylvania through connection at Beaver, Pa., at the junction of the Beaver River and the Ohio, at rates as low as those suggested by the P., L. & W. over its proposed branches.

## Youngstown District Slipping

Witnesses supporting the proposed construction program pointed out that they have appealed in vain to these carriers for river-and-rail service for many years and declared they had lost faith in them. They stated also that the proposed branches of the P., L. & W. would serve their interests best. In the meantime, they asserted, the iron and steel industry in the Valleys has reached a point of little or no profits, with no prospect of further development and every evidence that this industry, as well as other industrial activities of the district, will continue to decline. High freight rates were assigned as the reason for this situation. Unless the river service is made available, some witnesses went so far as to say, the very existence of the iron and steel industry in the Valleys will be threatened. A. E. Adams, Youngstown banker, testified that Youngstown has been strangled by high freight rates and has been able to



Map of Proposed P., L. & W. Extensions

live during the past 10 years only by past prosperity. He strongly urged lower rates to meet competition with rail-and-water service from the Pittsburgh and Wheeling districts, saying this was necessary to save the Valleys from industrial stagnation.

The proposed extensions would make Ohio River transportation available for coal coming from western Pennsylvania, thus affording water traffic for all but about 40 miles. This movement of coal into Youngstown was placed at 6,000,000 tons annually. It was declared that the Pittsburgh and Wheeling districts have access to much all-water service for both incoming shipments of raw materials and outgoing shipments of finished products.

The Valleys also see in the proposed branch lines a chance to put their products on the river with only about 40 miles of rail service and, by so doing, find it easier to compete with Pittsburgh and Wheeling producers in the markets of the Ohio and Mississippi Valleys which may be reached by reshipment of products from concentration warehouses located along the two rivers. Frank Purnell, assistant to the president of the Youngs-

town Sheet & Tube Co.; Richard Jones, Jr., counsel for the Republic Iron & Steel Co.; E. R. Griffith, traffic manager of the Sharon Steel Hoop Co.; H. D. Rhodhouse, traffic manager of the Youngstown Chamber of Commerce, and Mr. Adams testified that the Valley interests have been trying for many years to get relief from the so-called disruption of their competitive relationship with the Pittsburgh and Wheeling districts, which resulted, they said, from freight rate increases during the war.

## Sheet & Tube Company Would Cooperate

It was stated by Mr. Purnell that the interests of the Youngstown Sheet & Tube Co. and the Pittsburgh, Lisbon & Western Railroad are identical. He further said that Youngstown shippers must be assured of a permanent arrangement and that the proposed 60c. rate from Beaver, Pa., to Youngstown on coal from Pennsylvania would have to be subject to future adjustments as competitive conditions arose. He admitted that the Pennsylvania and the P. & L. E. have adequate capacity to handle the tonnage that would develop between Youngstown and Beaver and could afford probably a rate of 90c. on coal delivered from western Pennsylvania into Youngstown, as against the present rate of \$1.42.

In the course of further cross-examination, Mr. Pur-

nell said that the proposed branch of the P., L. & W. would connect with the Youngstown Sheet & Tube plant at Struthers, Ohio.

Mr. Purnell said that the Youngstown Sheet & Tube Co. expects to acquire all the equipment necessary to operate in connection with the branch line, including coal yards, etc., at Smith's Ferry. The company, he said, has no financial interest in the P., L. & W., but has promised to encourage operation of the line. He said the principal products the Sheet & Tube company would ship by rail and water via the proposed line would be steel pipe, wire, sheets and perhaps bars and plates. On redirect examination Mr. Purnell said the chief handicap suffered by Sheet & Tube company relates to fuel.

#### Freight Rate Handicaps

In his direct testimony Mr. Purnell said that the Youngstown district is the third largest producer of iron and steel products in the United States and, until comparatively recently, was the second largest, having been superseded by the development in the Chicago district. It was declared that output of iron and steel in the Youngstown district last year declined materially and that, had it not been for the Chicago properties of the Sheet & Tube company, it would have made scarcely any showing in the way of profit. This was attributed to the alleged handicap Youngstown suffers in the way of high freight rates, as compared with lower rail-and-water rates enjoyed by the Pittsburgh district.

Mr. Purnell complained that Youngstown had suffered because of the high freight cost of assembling raw material. He quoted rates and costs showing the advantage which, he declared, is now enjoyed by the Pittsburgh district in assembling costs of raw materials. Assembling costs of the basic raw materials for the blast furnace at Youngstown were said to be \$4.44 per ton, as against approximately \$2.59 for Aliquippa, Pa., and \$3.11 for the Pittsburgh district. He said that the additional cost needed to make and finish the steel is from 75c. to \$1.25 per ton, depending on how highly finished the steel is. These additional costs, it was stated, come as a result of additional steam coal and gas coal required beyond production of pig iron.

#### Pittsburgh Said to Have Profited

In 1923, Mr. Purnell stated, the Youngstown company purchased the Steel & Tube Co. of America at Chicago because of high freight rates into Youngstown, and future growth of the company, he added, will be in the Chicago district. In the Youngstown district, he said, it is not expected to expand in pig iron and steel production, "but only spend such sums as may be necessary to lower costs of production unless and

until we obtain material reductions on costs of transportation of our raw materials." Pittsburgh mills, he said, have established distributing points at Cincinnati, Louisville, Memphis, Tenn., and New Orleans in comparatively recent years and are shipping on their own barge lines and distributing from their warehouses at these points. Youngstown, he said, is denied use of the river and its fair share of business in the Mississippi and Ohio valleys, together with many points distant from the river. He cited instances of much business lost to the Youngstown district because of what he said were higher costs of production due to the so-called handicap in freight rates.

#### Traffic Increase on Ohio River Emphasized

It was brought out that iron and steel traffic on the Ohio River has trebled in the past six years. On the Allegheny and Monongahela rivers, it was testified, much of the through and local traffic, both in raw materials and finished products, arises from the iron and steel industry.

The entire P., L. & W. application, it was suggested in the testimony, is apparently based upon the fact that the Government has made a statutory declaration that its policy is "to promote, encourage and develop water transportation, service and facilities." Witnesses supporting the application made it evident that they have taken this declaration at its face value and have taken this way to show that the declaration of Congress and the many millions of dollars spent by the Federal Government on inland waterway development are not merely for the benefit of properties and industries located directly on rivers.

It was estimated that the through rate on coal from western Pennsylvania to Youngstown would range from 50c. to 75c. per ton by way of the proposed branch lines, while the existing rate from the Pittsburgh district is \$1.34 and from the Connellsville district it is \$1.43.

#### Say Cost Would Not Be High

Engineers for the Trunk Line carriers sought to show that the estimated cost of the proposed branch lines, \$5,500,000, was much too low. They placed the figure at \$8,500,000. This was combatted by proponents of the proposed line, who declared that the Trunk Line carriers had based the cost on much heavier and long lines, heavier bridges and greater right-of-way charges than would be involved, and had used their own construction costs as a basis. The plan, it was pointed out, was to adopt standards such as those existing on the Montour Railroad, which is engaged largely in transporting low-grade products, such as would be hauled by the proposed branches.

## MACHINERY EXPORT AGENCY

### Cooperative Sales Office for India Established by 26 American Companies

A GROUP of 26 American machine tool and supply manufacturers has arranged for cooperative selling effort in India. C. Warren-Boulton of Calcutta, India, has been appointed exclusive representative for a term of years, and after spending several months in the United States at the works of the companies he will represent, he is now on his way to India.

The cooperating companies are: Niles-Bement-Pond Co. and Pratt & Whitney Co., 111 Broadway, New York; Warner & Swasey Co., Osborn Mfg. Co., W. W. Sly Mfg. Co., Standard Tool Co. and National Acme Co., of Cleveland; E. W. Bliss Co., Brooklyn; Cushman Chuck Co. and Jacobs Mfg. Co., Hartford, Conn.; Landis Machine Co. and Landis Tool Co., Waynesboro, Pa.; Yates-American Machine Co., Rochester, N. Y.; L. S. Starrett Co., Athol, Mass.; Kearney & Trecker Corporation, Milwaukee; Barnes Drill Co., Rockford, Ill.; Monarch Machine Tool Co., Sidney, Ohio; Simonds Saw & Steel Co., Fitchburg, Mass.; Morton Mfg. Co., Muskegon Heights, Mich.; J. G. Blount Co., Everett, Mass.; Cincinnati Shaper Co., Cincinnati; J. H. Williams & Co., Buffalo; C. C. Bradley & Son, Inc., Syracuse, N. Y.; Racine Tool & Machine Co., Racine, Wis.; Adams Co.,

Dubuque, Iowa; Gallmeyer & Livingston Co., Grand Rapids, Mich.

These companies cover a wide field of machine tools and accessories. While the group is not definitely and finally closed for membership, it is not the intention to expand it materially. Non-competing manufacturers of machine tools may obtain information on this group from R. M. Derby, manager foreign department, Niles-Bement-Pond Co. and Pratt & Whitney Co., 111 Broadway, New York, or from C. J. Stilwell, sales manager, Warner & Swasey Co., Cleveland.

### Central Iron & Steel Co. Entertains Engineers at Plant Inspection

The Central Iron & Steel Co., Harrisburg, Pa., Robert H. Irons, president, was host on Wednesday afternoon, May 16, to a large group of engineers from the Susquehanna section of the American Society of Mechanical Engineers. Following a buffet luncheon, the engineers were taken through the plant on cars and were given an opportunity to inspect all departments, a particular object of interest being the Fuller-Lehigh coal pulverizing plant. At the time of the inspection, one of the mills was rolling floor plate to be laid in one of the new buildings of the Ford Motor Co., Detroit.



# Press for Lower Freight Rate to Coast

## Mid-West Steel Interests and Illinois Central Railroad Petition for Reduced Water-and-Rail Rate—Question Commission's Jurisdiction

WASHINGTON, May 22.—Struggles within the iron and steel industry of the United States to recover, maintain or build up markets through desirable freight levels have been particularly marked since the decision of the Interstate Commerce Commission in April, 1925, in the so-called Jones & Laughlin case, which readjusted rates on a mileage basis from Pittsburgh and Chicago. Succeeding conflicts between various districts of the industry have followed through a number of important proceedings, some of which have been decided, such as the Consolidated Southwestern cases, Central Freight Association pig iron cases, long-and-short haul cases and the export rate case, in which rates for shipment of iron and steel abroad were reduced by 20 per cent. Meanwhile there is pending the broad investigation under the Hoch-Smith resolution which proposes readjustment of the entire iron and steel rate structure throughout Official Classification territory. Also an important bearing on the situation is given by the application of the Pittsburgh, Lisbon & Western Railroad to connect the Mahoning and Shenango valleys with the Ohio River.

Most recent is the proposal of the Illinois Central Railroad to join with the Redwood steamship line and equalize the Chicago district with Pittsburgh and other Eastern producing sections in iron and steel rates to Pacific Coast ports. The Illinois Central tariff proposes a reduction of 8.5c. per 100 lb. on iron and steel moving from the Chicago district through New Orleans, the schedules, filed to become effective May 31, ranging from 56c. to 86c. per 100 lb. Producers and railroads in the East are offering spirited opposition to the proposed tariff, while Middle Western producers and the Illinois Central are making equally strong efforts on behalf of the new rates. Each side stoutly maintains its position in petitions filed with the Interstate Commerce Commission. The substance of claims of some protestants, including Pittsburgh district producers and Eastern carriers, was published in THE IRON AGE of May 10, page 1328.

Petitions to permit the new rates to become effective were filed subsequently by Middle Western independent steel interests, the Illinois Central Railroad and others. Among those joining the Middle Western producers is the Youngstown Sheet & Tube Co. The United States Steel Corporation strongly opposes the Illinois Central tariff, as does its subsidiary, the Elgin, Joliet & Eastern Railway. Among its steel producing companies, the American Sheet & Tin Plate Co., the Carnegie Steel Co., the American Bridge Co. and the National Tube Co. charge that the proposed rates would deprive them of their natural advantages, in reaching the Pacific Coast markets through Atlantic ports and the Panama Canal. The Illinois Steel Co., Steel Corporation subsidiary in the Chicago district, has filed no petition.

Independent steel producers in the latter district have pointed out in their petitions that the E. J. & E. not only has refused to concur in the proposed rates but that, acting under the direction of the Steel Corporation, has asked for their suspension "all to the detriment of the Middle West and Chicago producers of iron and steel articles and railroads serving said districts, including the Elgin, Joliet & Eastern." Separation of the Isthmian Steamship Line from ownership by the Steel Corporation is asked the commission. It is requested to reverse its decision approving such ownership of this line, which operates through the Panama Canal. Despite the commission's finding, it is charged that ownership of this water line by the Steel Corporation is in violation of the Clayton act, it being alleged that it does away with competition between the water carrier and the E. J. & E. The peti-

tion seeking this action was filed by Clayton, Mark & Co. and the Acme Steel Co., and is signed by Robert Hula, traffic manager and assistant sales manager of the former company, and J. B. O'Rear, traffic manager of the Acme company.

It is charged that the ownership of the steamship line by the Steel Corporation results in a policy of having the railroads maintain high rates on iron and steel from the Chicago district to Pacific Coast ports. The claim is made that the Steel Corporation desires to serve this market from its Pittsburgh district mills by way of the Atlantic ports and the Isthmian line. The declaration is made that prior to the development of the Isthmian line, the E. J. & E. favored low rates from the Chicago district to the Pacific Coast, and that this was also true regarding the Steel Corporation itself as reflected, it is maintained, in a petition of the Illinois Steel Co., in 1922, supporting a fourth section application to obtain low rates from the Chicago district to Pacific ports. Middle Western producers, it is asserted, have been virtually excluded from the Pacific Coast market by reason of the lower rail-and-water rates from the Pittsburgh district through the canal.

Other independent iron and steel interests in the Chicago and adjacent territory, together with the Chicago Association of Commerce, the Peoria Association of Commerce, the Rockford Manufacturers' and Shippers' Association, the Bloomington Association of Commerce, the Louisville Board of Trade, the Evansville Chamber of Commerce, the Indiana Chamber of Commerce, the Springfield Chamber of Commerce, the Illinois Manufacturers' Association and additional organizations and concerns, filed a joint petition supporting the Illinois Central tariff. They called attention to the fact that the protestants had referred only to the great disparity in land distances from Chicago to New Orleans, on the one hand, and the land distances from Pittsburgh to Baltimore, on the other hand. Instead of confining their calculation to this basis they turn to the relative distances by rail-and-water from the Middle West and Pittsburgh to the Pacific Coast, stating that the average distance from the Middle West is 242 miles less than from Pittsburgh.

"It is ridiculously absurd for the protesting producers in the Pittsburgh and Valley district," said the petition, "to contend that they will be unable to meet Middle Western competitors in a given market when they now have the advantage in price of from \$2 to \$4 a ton, and it will therefore be readily seen that the mere equalization of freight rates will in no wise impair the ability of Eastern producers to market their products in Pacific Coast markets. In fact, it is the Chicago and Middle Western producer who will be obliged to absorb such disadvantages in price if they expect to participate in the Pacific Coast business."

It is also declared to be ridiculous for the Eastern shippers to contend that the Eastern carriers will be obliged to reduce their rates to a relative basis, and it is stated that the assertion by the Eastern carriers of an impending rate war is entirely unfounded and absurd under these conditions.

"The proposed tariff holds out the first ray of hope of allowing the Middle Western manufacturer and shipper to retrieve a loss occasioned by construction of the Panama Canal," it is stated. "This tariff will have the effect of bringing back to the Middle Western shippers the opportunity to compete on traffic which they formerly enjoyed and to which they are justly entitled."

The Illinois Central Railroad in its petition laid down two broad principles. First, it was stated that the commission has no power to establish the proposed

(Concluded on page 1512)



## GRAY IRON INSTITUTE

### New Organization Elects Directors and Officers at Philadelphia Meeting

THE Gray Iron Institute held its first general meeting at Philadelphia, May 18, on the occasion of the convention of the American Foundrymen's Association. A certificate of incorporation, by-laws and a report of a committee on merchandising were adopted, and officers and directors were chosen. At the conclusion of the meeting numerous applications for membership in the institute were received.

A board of directors nominated by a committee headed by Walter Wood, R. D. Wood & Co., Philadelphia, was elected unanimously as follows:

Walter L. Seelbach, Forest City-Walworth Run Foundries Co., Cleveland

A. E. Hageboeck, Frank Foundries Corporation, Moline, Ill.

J. H. Bruce, Bowler Foundry Co., Cleveland

J. L. Carter, Barlow Foundry Co., Newark, N. J.

H. S. Chafee, Builders Iron Foundry, Providence, R. I.

A. E. Clarke, Des Plaines Foundry Co., Des Plaines, Ill.

J. D. Colman, Bullard Machine Tool Co., Bridgeport, Conn.

Horace R. Culling, Carondelet Foundry Co., St. Louis

Fred Erb, Erb-Joyce Foundry Co., Detroit

W. J. Grede, Liberty Foundry Co., Milwaukee

A. J. Hartman, United Engineering & Foundry Co., Pittsburgh

John Hartman, Atlas Foundry & Machinery Co., Tacoma, Wash.

B. H. Johnson, Cresson-Morris Co., Philadelphia

Don McDaniel, Hamilton Foundry & Machine Co., Hamilton, Ohio

Edward B. Sherwin, Chicago Hardware Foundry Co., North Chicago, Ill.

The board of directors elected the following officers: Walter L. Seelbach, president; B. H. Johnson, first vice-president; A. E. Hageboeck, second vice-president; H. S. Chafee, treasurer. These officers, with J. L. Carter, Newark, N. J., compose the executive committee. Dan M. Avey, editor *Foundry*, Cleveland, who has been temporary secretary since the preliminary organization of the institute, will continue in that capacity until a secretary-manager is chosen by the executive committee.

The Gray Iron Institute is the outcome of two movements, one of which started in Philadelphia and the other in the Central West, which recognized the need of cooperative effort to improve the quality of gray iron castings through research and to perfect merchandising methods. At a conference held in Philadelphia, Feb. 13, the two groups decided to pool their efforts, and on March 13 a meeting was held at Pittsburgh, where a temporary organization was effected.

#### Purpose of the Institute

The purpose of the institute is to promote the interests of the gray iron foundry industry by all lawful means, such as—

1. The promotion of sound business ethics in the industry, based on honor and integrity in manufacturing and selling gray iron castings by its members.
2. The collection and distribution of information relative to the manufacture of gray iron castings.
3. To study new methods for merchandising gray iron castings, to strengthen present markets, to develop new markets and to discover new uses for gray iron castings.
4. The promotion of uniformity in methods of cost accounting.
5. Research work to improve further the quality of gray iron castings and to increase their utilization in industry, cooperating with other research agencies toward that end.
6. The stimulation, by cooperative effort, of the use and sale of gray iron castings.
7. The establishment and maintenance of standards of quality for gray iron castings.

The officers elected at Philadelphia will hold office only until the first annual convention, which will be held this fall.

A feature of the Philadelphia meeting was an inspiring address by Charles F. Abbott, executive director American Institute of Steel Construction, New York. Businesses, he said, differ only in details; in principles they are all alike. Current economic problems cannot be solved by the individual. Unorganized industries have lost the aggressive and are being told by buyers what they can expect. The new competition is not

between individuals but between industries for a share of the consumer's dollar. We find reinforced concrete arrayed against structural steel, electric refrigeration against ice, oil against coal, Florida against California, lumber substitutes against lumber, etc. Incidentally, the lumber industry has appropriated \$25,000,000 to regain lost markets.

The difficulties confronting an industry are national, not local, in scope. An individual plant is solely dependent on the fortunes of the industry to which it belongs. It has been argued that the small company should be eliminated, but such elimination would not be a cure for a condition characterized by excess capacity, since a new crop of small plants would spring up to take the place of those that went out of business. A spirit of "live and let live" should control the policy of each industry. It is better, said Mr. Abbott, to operate at 60 per cent at a profit than to run full at cost or less than cost. The problem of a given industry is also the problem of the nation at large. If industries cannot find a way to operate profitably, the unemployment problem is bound to grow worse. If companies cannot make profits in fairly active times, what can be expected if a depression sets in?

## MECHANICAL ENGINEERS

### Nominees for Officers of American Society—Award of Holley Medal

ELMER A. SPERRY, of gyroscope fame and the organizer recently of the Sperry Rail Service Corporation for investigating such matters as transverse fissures or other defects in steel rails, came in for special honors at the meeting last week in Pittsburgh of the American Society of Mechanical Engineers. He was awarded the Alexander Holley medal and was nominated as president of the society for the year beginning in December. Mr. Sperry is chairman of the Sperry Gyroscope Co., Brooklyn, which has manufactured gyroscopic compasses and also gyroscopic stabilizers, as for shipboard, and searchlights of high candle-power.

The Holley medal was presented to Mr. Sperry by George I. Rockwood, Rockwood Sprinkler Co., Worcester, Mass., who instituted and endowed the medal in 1924. The medal is bestowed "for some great and unique act of genius of an engineering nature that has accomplished a great and timely public benefit," and Mr. Rockwood characterized the invention of the gyroscopic compass as a brilliant, valuable achievement.

Charles M. Schwab, past-president of the society, was also present at the banquet and gave one of his characteristic talks. George S. Davison, past-president American Society of Civil Engineers, was toastmaster, being introduced by A. N. Diehl, vice-president Carnegie Steel Co., who was general chairman of the subcommittees for the 1928 spring meeting.

The other nominees for office, as presented by the regular nominating committee of the society are given below. Election will be by letter ballot of the membership, closing on Sept. 25.

**Vice-presidents**, William Elmer, special engineer, Pennsylvania Railroad, Philadelphia; Robert L. Daugherty, professor mechanical and hydraulic engineering, California Institute of Technology, Pasadena, Cal., and Charles E. Gorton, chairman, American Uniform Boiler Law Society, New York.

**Managers**, Charles M. Allen, professor of hydraulic engineering, Worcester Polytechnic Institute, Worcester, Mass.; Robert M. Gates, manager, industrial division, Superheater Co., New York, and Ely C. Hutchinson, president and general manager, Pelton Water Wheel Co., San Francisco.

**Delegates to the American Engineering Council**: Elmer A. Sperry, Brooklyn; E. O. Eastwood, University of Washington, Seattle; Dean E. Foster, Tulsa; W. P. Hunt, president Moline Tool Co., Moline; O. P. Hood, Bureau of Mines, Washington; Charles Penrose, Day & Zimmermann, Philadelphia; Frank A. Scott, Warner & Swasey Co., Cleveland; Max Toltz, St. Paul; E. N. Trump, Solvay Process Co., Syracuse; and D. Robert Yarnall, Yarnall-Waring Co., Philadelphia.

## NEW HEALD INTERNAL GRINDER

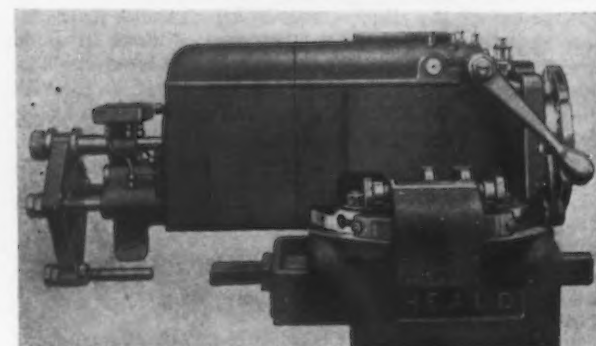
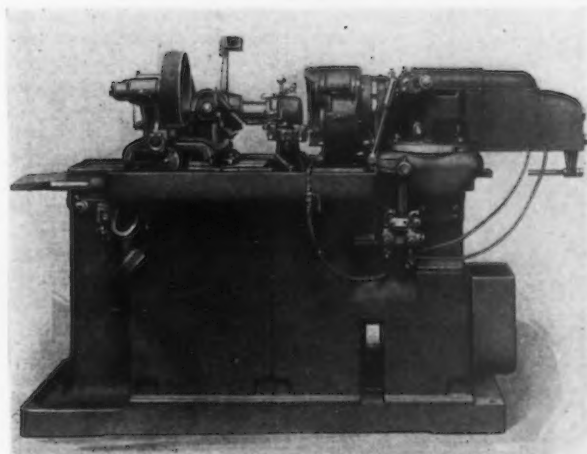
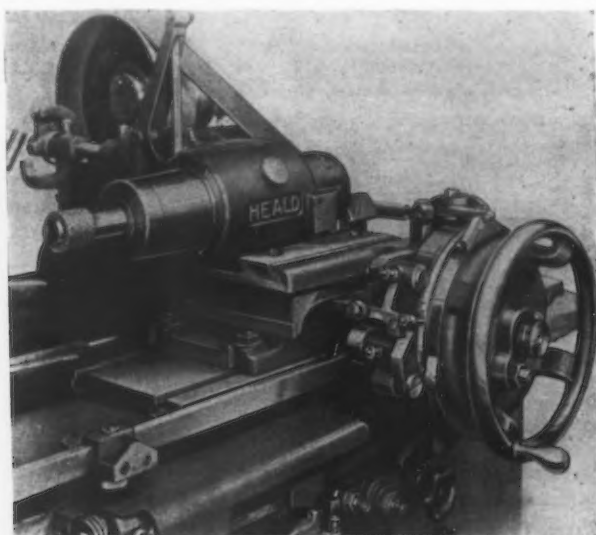
### Gage-Matic Unit Offered for Continuous Production of Straight Open-End Work

THE Heald Machine Co., Worcester, Mass., has brought out a new internal grinding machine, named the Gage-Matic, for continuous production of straight open-end work, such as ball bearings, bushings, gears and similar parts.

The machine was made possible when the company acquired the internal grinding machine line of the Giddings & Lewis Co., Fond du Lac, Wis., which purchase embraced not only the machines but also all patent rights, including the McDonough automatic gaging device patents. The latter device is an essential element of the Teromatic internal grinder, and is

position, truing the wheel. The wheel again enters the work and grinds with finishing feed and speed until the gaging plug enters the hole, when a second electric contact causes the wheel to withdraw and the entire machine to come to the rest position. The work is chucked from the front and is held by quick-acting fixtures, oil-operated to give a quick, positive and flexible movement with no effort on the part of the operator.

The workhead is mounted on a rigid bridge which in turn is bolted directly to the base. The swivel circle has been enlarged to 16 in. in diameter, and movement is obtained through knurled knobs on the front of the bridge. The work spindle runs in large, self-adjusting ball bearings. A multiple-disk clutch on the inside of the work spindle provides positive drive, and a separate multiple disk brake arrangement is provided to stop the work spindle as the pulley clutch is released. The



*After the Work Is Chucked and the Starting Lever Thrown, the Cycle of Operation, Including Gaging, Is Automatic. Arrangement of the cross-slide is shown at upper right, and a close-up view of the work-head at the lower right*

likewise a fundamental mechanism in the Gage-Matic. Its positive sizing plug permits consistent sizing even where the limits are unusually close, and only slight attention is demanded of the operator.

The gaging device on the new machine differs from that on the Teromatic in that a single disk is used, which controls the sizing and permits the grinding of fairly short work. The control for short stroking the table at the proper time to enable the wheel to be trued is on the cross-slide, where a single electric contact point performs the operation. The cross-slide is similar to that of the company's Size-Matic, to which the Gage-Matic is a companion machine, using the same base with hydraulic drive for the table, the same wheel-head, the same wheel-truing device and with the same motor and belt main drives.

When the operator has chucked the work and thrown over the starting lever, the cycle of operation is entirely automatic. The wheel enters the work and rough grinds at roughing speed and feed until only a predetermined amount of stock is left. Then a contact is made on the cross-slide, the table short strokes, changes to truing speed and the diamond drops into

brake works automatically while grinding is in progress, but it may also be operated by hand.

Working in conjunction with the workhead is the size gage mechanism. This consists of a gage mounted on the end of a rod which revolves with the work spindle, concentric with it and reciprocating in synchronism with the main table in such a manner that as the front end of the wheel clears the back of the hole, the gage is firmly pressed against the piece at this point. The sizing is complete as soon as the gage enters the hole, when an electric contact is made and the machine comes to rest.

The cross-slide, which carries the flexible idler and wheelhead, is mounted on the table. Coarse feed for the wheel may be set for rough grinding up to within a desired limit of finish size of hole, when the roughing feed changes automatically to a finishing feed. The change is mechanical and positive, taking place just before the diamond trues the wheel.

Wheel-truing is controlled from a cross-slide by a slip ring carrying a stop, which at a set point engages a finger. This forms an electric contact that permits current from a generator on the back of the machine

to energize a magnet which operates the various levers and dogs necessary to short stroke the table and drop the diamond to position. The same slip ring after engaging with the finger permits the handwheel to progress further on each successive work piece by an amount approximately equal to the reduction of the wheel due to grinding and dressing, thus compensating for wheel wear.

## Shankless Tool Bits and Holders for Wheel and Other Heavy Turning

Shankless tool bits and tool holders for locomotive tire and other heavy turning operations have been placed on the market by the O. K. Tool Co., Shelton, Conn.

The tool bits are retained in the holder by a double-tapered groove as shown in the illustration and are,



*The Tools Are Made in Right- and Left-Hand Types. The small holder, in the foreground, is for use in grinding the tool bits*

in effect, self-locking in the direction of the feed, although the usual rear locking arrangement is used in the holder. The tool may be adjusted sidewise for wear in the direction of the feed merely by moving the lock forward, which makes the bit project farther out of the side of the holder.

In having no shank, manufacture of the tool bit is simplified and the cost is reduced. Another advantage emphasized is that in having no hole through it, the tool holder is stronger.

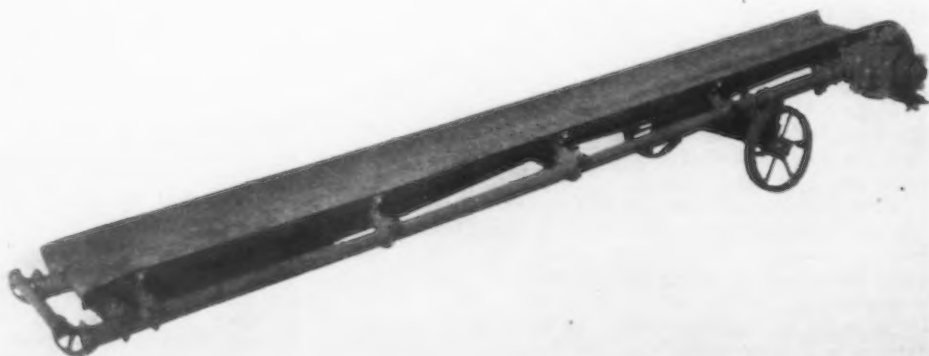
Tool bits may be removed, reground and replaced conveniently, a hand grinding holder, shown in the foreground of the illustration, being available to facilitate grinding of the bits. The tool bits are of drop forged high-speed steel, carefully heat treated. The holder is of forged chrome-nickel steel, heat treated. The tools are available in a number of sizes and in right- and left-hand types.

## Light, Rugged Construction Features Portable Conveyor

Built light enough so that one man can move it easily and quickly, the "Jax" portable conveyor has been brought out by the Link-Belt Co., Chicago, for unloading packages, bags, coal, rock, etc., on wharves, from or to box cars, both indoors and out. Mounted on agricultural-type wheels of 14-in. diameter and 2-in. face, this 12-ft. conveyor complete, with  $\frac{3}{4}$ -hp. motor, weighs but 640 lb. The 15-ft. conveyor, complete, with motor, weighs 710 lb.

The wheels are movable to practically any point along the frame, which consists of two heavy pipes tied together at head and foot ends by electric steel castings. A pipe handle at the foot end facilitates handling. The casting at the head end provides a base for

*The Conveyor Can Be Moved Easily by One Man. The wheels are movable to any point along the heavy pipe-form frame*



the motor and a grease-tight inclosed housing in which the cut reduction gears operate.

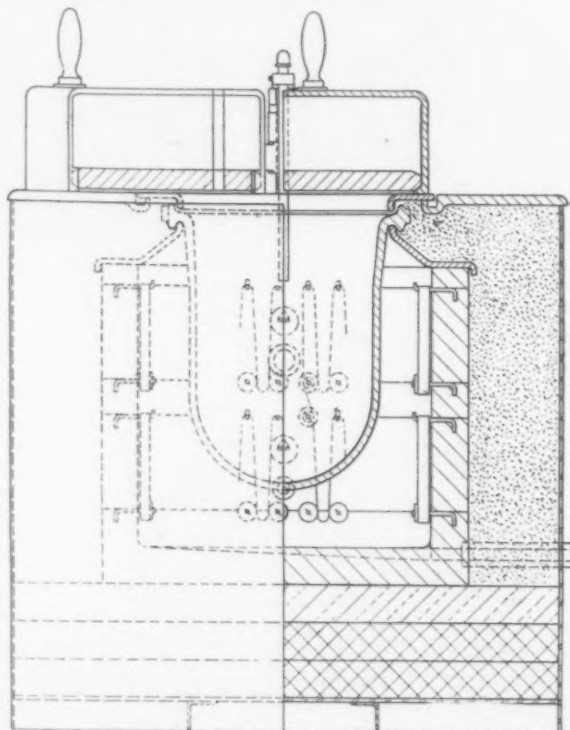
The height of the discharge point of the conveyor can be adjusted by moving the wheels forward or backward along the conveyor frame. The wheels are provided with three positions for vertical adjustment. Lubrication is seldom necessary, as all bearings are of the anti-friction type and all gears run in a bath of grease.

Designed for a speed of 200 ft. a minute, the three-ply rubber belt, with  $\frac{1}{8}$ -in. rubber cover, is 12 in. wide. Steel skirt boards, forming a belt trough, are arranged for endlap into additional units, if required.

## Electrically Heated Lead Pots

A series of electrically heated lead pots has been designed by General Electric Co., Schenectady, N. Y. The pots range in size from 8 in. in diameter by 12 in. deep to 16 in. in diameter by 24 in. deep. The smallest will heat 75 lb. of steel per hour to 1500 deg. Fahr. When working at this rate it uses 11 kw. of single-phase power at 75 volts. The largest will harden 250 lb. steel per hour, using 29 kw. at 220 volts.

Pots are of special alloy, and rest on an alloy collar



built into the fire brick casing. The upper flange of the pot is separated by a ring of insulation from the cast iron drip plate; thus heat losses by conduction are reduced to the minimum. Heating units are ranged on the inside walls of the cavity surrounding the pot.

Heating curves have been worked out showing that a small furnace, for instance, will cool to 750 deg. in a 13.5-hr. overnight shutdown, following which it will require 70 min. on power to reach 1500 deg. After a 43-hr. week-end shutdown, the furnace will be at 250 deg. Fahr. and will require 2 hr. 10 min. to reach heat.

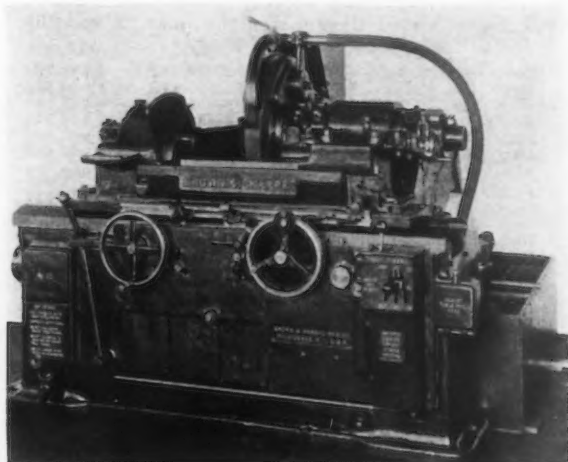


## HEAVY-DUTY PLAIN GRINDERS

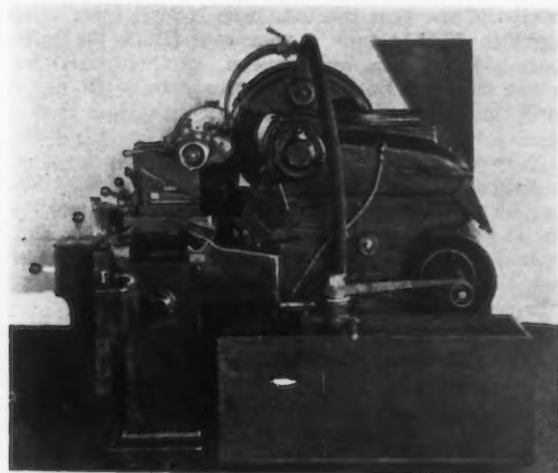
Massive Design, Wide Range of Speeds and Ease of Control Are Features of New Production Units

**S**MOOTH operation, increased speed, and facility of control are features of a new series of plain grinding machines for heavy-duty production work, which is being placed on the market by the Brown & Sharpe Mfg. Co., Providence, R. I.

Three sizes of the machine, designated as the No. 30, 32 and 33, respectively, and of similar design except for length of bed, are available. Two modified



*The No. 30 Plain Grinder With Belt Drive Is Shown Above. The rugged construction may be noted from the view of the right-hand end of the machine, below*



forms of each size of machine, for work not requiring all of the automatic features, can also be furnished. The capacity is for work 18, 36 and 48 in. long respectively, between centers. The centers will swing 12 in. in diameter with 24-in. wheels having from 2 to 10 in. width of face, and 6 in. in diameter with 30-in. wheels having 2 to 6 in. face.

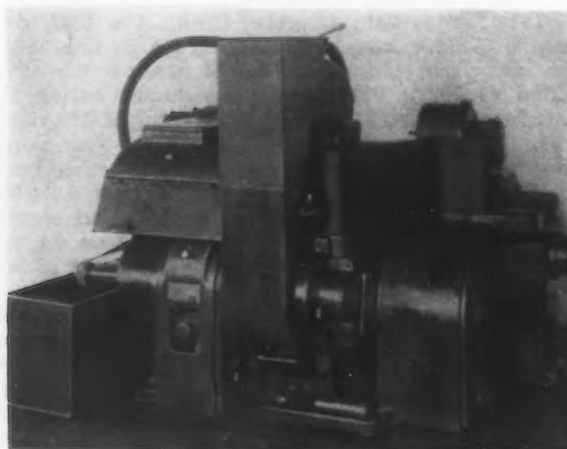
The machines are essentially production units and have an unusually wide range of table and work speeds. Because of a table dwell, which is provided at each end of the table, and a shock absorber in the reversing mechanism, high table speeds may be used without affecting the finish on the work. In this connection it is stated that the table dwell permits unusual finish on the work.

Operating controls are grouped so that they may be reached conveniently from the normal operating position. Changes of speed of the work drive and table movement, which are entirely independent, are made through sliding gears by means of individual levers. Cross feed controls, both for automatic and hand operation, are located on the right-hand feeding wheel. Adjustment for the table dwell is located at the

extreme right. Both spring-lever and screw-and-hand-wheel operation of the footstock are provided.

The machines are of heavy construction to assure high degree of accuracy. Special care is said to have been taken to make the work drive smooth and vibrationless, this being accomplished by the combination of a torsion shaft and balanced belt drive from within the machine. The wheel-slide and wheel-slide base are heavy and of rugged design, and have long automatically lubricated ways which assure accurate alinement and full support to the wheel spindle. The bed is of ample length to support the sliding table at all points in its travel. All moving parts and scraped surfaces are well guarded in all positions.

Lubrication of the wheel spindle and all main mechanisms is by gravity flow of filtered oil from a reservoir which is kept filled with oil by means of a geared pump. The wheel-slide incloses the oil filters which are conveniently accessible for cleaning. The few necessary oiling stations are clearly marked with the necessary instructions as to the intervals at which oiling is required. The coolant tank is separate from



*A Compartment in the Base Accommodates the Driving Motor, Which Is Protected by a Hood, but Is Accessible for Lubrication. Arrangement of the rear of the machine may be noted from the view above*



the machine, but is arranged to come within the floor space limits, as shown.

Either overhead countershaft or motor drive arrangement is available. One main motor drives the entire machine. When motor equipped, the motor, of 15 to 40 hp., depending upon the work to be ground, is inclosed in a compartment in the base of the machine. The compartment is hooded, as shown, which protects the motor but permits easy access for lubrication. The control equipment may be mounted on a stand close to the base of the machine and within the floor space limits.

One of the modified machines, designated as the "A" machine, is provided with hand operation for the table, with one power table feed for wheel truing, and is adapted particularly for straight-in-feed grinding, using either power or hand cross-feeds. The second modified machine, the "B," has only hand table and cross-feeds. This unit is also for straight-in-feed grinding, using hand cross feed only.

## Coke Production Continues at Exceptionally High Rate

WASHINGTON, May 19.—The rate of production of by-product coke in April was the highest, except for that of March, in the history of the industry, according to the Bureau of Mines. Total output in the 30 days of April was 3,925,195 net tons, against 4,064,940 tons in March. The decrease of 0.2 per cent in the daily output in April reflected a decline in the demand for house-heating fuel with the coming of milder weather. There were 79 by-product plants active in April, and these plants produced about 84 per cent of their capacity. The output of beehive coke was 377,000 tons in April as compared with 449,000 tons in March, a decrease of 16 per cent. The total production of all coke was 4,302,195 tons, of which 91.2 per cent was contributed by the by-product plants and 8.8 per cent by the beehive ovens.

Taking its figures from THE IRON AGE, the bureau shows that the output of pig iron in April was 3,185,504 gross tons, or 106,183 tons a day, an increase of 2.9 per cent over March in daily rate, but a decrease of 7 per cent when compared with April of last year.

Total production of coke during the first four months of 1928 was 17,202,404 tons, a decline of 4.1 per cent from the production of the corresponding period of 1927. By-product coke output during the first four months, however, with a total of 15,610,404 tons, showed a gain over 1927, when the four-month total was 14,727,829 tons. Beehive production made a sharp decline to 1,592,000 tons, as against 3,210,000 tons. Pig iron production during the first four months of 1928, amounting to 12,155,065 tons, was 6.1 per cent under the output of the first four months of last year, when the total was 12,950,087 tons.

In response to requests for information on the relative rate of increase in the output of domestic and of metallurgical coke, the bureau has prepared a table giving data for the period 1915-1926. The highest production of all coke for this period was in 1918, aggregating 56,611,766 tons, of which 50,002,988 tons was consumed in the blast furnace and 3,861,208 tons in the foundry cupola. Of these tonnages 21,901,043 tons of the furnace coke was made at by-product plants and 28,101,945 tons at beehive plants, while 1,631,052 tons of the 72-hr. fuel was made in by-product plants and 2,230,156 tons in beehive ovens. In 1926 total production of all coke was 56,420,484 tons—within  $\frac{1}{2}$  per cent of the maximum—of which 45,019,560 tons was consumed by blast furnaces and 3,331,677 tons by foundry cupolas. Of the metallurgical coke, 35,028,461 tons and 2,168,017 tons respectively were by-product fuel and 9,991,099 tons and 1,163,660 tons beehive coke.

## Sharp Drop in Foundry Equipment Orders

Orders for foundry equipment in April are reported by the Foundry Equipment Manufacturers' Association at 107.7 per cent of the average monthly shipments for 1922, 1923 and 1924. This is a decline of nearly one-fourth from the 138.6 reported for March, and represents the lowest figure for any month so far this year. It compares with 130 in April, 1927, and with 113.2 in April, 1926. It represents the lowest April figure since 1922.

Shipments in April are given at 112.5 and unfilled orders at 126.1, on the same base as for new orders.

## Wholesale Prices Up in April

The index number for wholesale prices reported by the Bureau of Labor Statistics, on the base of 100 as the average for 1926, was 97.4 for April, 1928. This is a substantial increase from the 96 of the preceding month and is still further above the 93.7 of April, 1927. Of the 10 major groups, five showed increases, two decreases and three remained stationary. Metals and metal products, at 98.4, did not change from the March figure. Both were slightly above the 97.8 of a year ago. Iron and steel under this heading showed a slight decline, with non-ferrous metals slightly higher. Agricultural implements and automobiles did not change.

## Heavy Decline in Steel Corporation Unfilled Orders

Unfilled orders on the books of the United States Steel Corporation showed a decline in April of 463,073 tons, or nearly 11 per cent of the 4,335,206 tons reported at the end of March. The figure on April 30 was 3,872,133 tons. While this is higher than the corresponding figure at the end of April of 1927 or of 1926, it is the lowest figure reported since Nov. 30, last. However, the four months preceding April, 1928, and the figure for the last day of 1926, are the only ones in more than two years which have been higher than the current figure. One year ago the unfilled orders amounted to 3,456,132 tons, or 11 per cent under the recent figure, while two years ago, at 3,867,976 tons, the recent figure was closely paralleled. The table gives the reported figures for the past 28 months.

		1928	1927	1926
Jan.	31.....	4,275,947	3,800,177	4,882,739
Feb.	28.....	4,398,189	3,597,119	4,616,822
Mar.	31.....	4,335,206	3,553,140	4,379,935
April	30.....	3,872,133	3,456,132	3,867,976
May	31.....	.....	3,050,941	3,649,250
June	30.....	.....	3,053,246	3,478,642
July	31.....	.....	3,142,014	3,602,522
Aug.	31.....	.....	3,196,037	3,542,335
Sept.	30.....	.....	3,148,113	3,593,509
Oct.	31.....	.....	3,341,040	3,683,661
Nov.	30.....	.....	3,454,444	3,807,447
Dec.	31.....	.....	3,972,874	3,960,969

At the end of April, 1917, the highest total in unfilled orders of the Steel Corporation ever attained was reported at 12,183,193 tons. The lowest figure ever reported was 2,754,757 tons, Dec. 31, 1910.

## Smaller Production of Commercial Steel Castings

Production in April of commercial steel castings is reported by the Department of Commerce at 83,795 tons. This is the smallest monthly total since December, comparing with 92,806 tons in March. In April, 1927, the output was 94,677 tons. For the first four months of the year the total was 338,006 tons, comparing with 373,514 tons a year ago. Both the railroad specialties and the miscellaneous castings participated in the decline. Each was approximately 10 per cent lower in the first four months of this year than last year.

New orders in April were only slightly lower than in March, being reported at 81,835 tons against 82,536 tons. This compares with 81,044 tons in April, 1927. For the first four months the total was 346,120 tons against 373,547 tons last year. The reduction was less than in production and both classes of castings were influenced in about equal proportions.

Railroad specialties ordered in April were 32,722 tons, or 49 per cent of capacity, comparing with 32,279 tons a year ago—also 49 per cent of capacity. Miscellaneous castings ordered in April amounted to 49,113 tons, or 63 per cent of capacity, comparing with 48,765 tons a year ago—also 63 per cent of capacity. Orders for railroad castings in April showed a gain over March, which recorded 30,992 tons, but miscellaneous castings fell below March, in which 51,554 tons were ordered.

## Heavy Production of Steel Barrels

Steel barrels manufactured in April are reported by the United States Department of Commerce at 667,827—a gain of 5 per cent over the high production of March and the highest total which has been reported since these figures were first compiled, in 1923. In April, 1927, the total was 599,771—a figure which was exceeded by only one month that year. Shipments in April fell 1 per cent behind production; in March, shipments were somewhat above production. Unfilled orders declined about 70,000 units during the month. As of April 30, they called for 357,131 units for delivery within 30 days and 919,863 units for later delivery.

Shipments of members of the Steel Barrel Manufacturers' Institute in April totaled 370,960 units, with 457,832 unfilled orders on hand on May 1. Capacity was engaged during the month to the extent of 57 per cent, rating 22.6 per cent for I.C.C. barrels and 66.5 per cent for light barrels.

# Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Current Statistical Data, Considered Independently of Trade Opinion, Indicate That:

Steel ingot output may hold large for several weeks more, but a sharp and prolonged decline is likely to follow.

Unfilled orders showed a heavy decrease in April but remained higher than at the same time for two years past.

Pig iron production continues moderate compared with ingot output; prices are decidedly low.

Finished steel prices are almost in line with the general level of commodity prices and no early change is indicated.

IT may be said that the most notable general development in the iron and steel industry is the negative one that the industry is not gaining in activity or prosperity. Prices are rather weak. If industries in general were expanding and prosperity were on the increase, the upward trend would probably be reflected in growing activity in iron and steel and strong prices for those products. The absence of this condition is an unfavorable indication.

## Ingot Production Above Requirements

AS nearly as it can be measured the position of the steel industry at the beginning of May can be summed up as follows:

(1) Steel ingot production showed an average rate about 19 per cent above normal.

(2) The production of steel ingots was in excess of the indicated current requirements of the chief consuming industries.

(3) Production had increased over the March rate, in spite of the fact that there is usually a seasonal decline in April—in short, the *trend* was upward.

(4) The trend of the unfilled orders of the Steel Corporation was downward, which presumably represents the situation in general.

(5) The volume of unfilled orders, after making due allowance for the merely seasonal changes, was 89 per cent of the average for the years 1923-1927.

(6) The average price of finished steel was holding barely steady, the April average, according to THE IRON AGE composite index, being 2.359c. against 2.361c. in March. It compares with 2.360c. a year ago.

This list of facts can hardly be called "bullish" as regards the outlook for the industry during the next few months. If we make allowance for the slow normal growth in the country's requirements, the production

of steel ingots is found to have been the highest last month that has existed since the middle of 1923. It represented an annual rate which the experience of recent years shows cannot be long maintained. However conditions may seem, the cold statistical facts indicate that steel production is excessive.

This is the clearer in that the high production is not warranted by the volume of forward buying. There was a decrease of 463,000 tons in the unfilled orders of the Steel Corporation, substantiated by trade reports of a decreasing volume of new business. This indicates that current activity in steel making must be justified, if at all, by current requirements of steel-consuming industries. But in our analysis of demand last week reasons were presented for believing that such requirements are likely to decline, if they are not already pointed downward.

The trend of steel prices is certainly not upward. The response to the gain in unfilled orders during the first few months of the year was very limited and it may even be doubted if the price concessions that have been made have not quite counterbalanced most of the small advance.

Steel production will probably hold large through May—perhaps even through June—but under the foregoing circumstances a fairly sharp and prolonged decline seems probable thereafter. Steel prices can hardly advance. At the same time, they can hardly decline much from such a low level as now exists. It seems probable, therefore, that there will be approximate stability for another month or two.

## Pig Iron Output Low in Relation to Steel

PRODUCTION of pig iron continues very moderate compared with the steel output. In April the daily average was about 106,000 tons, against 103,200 tons

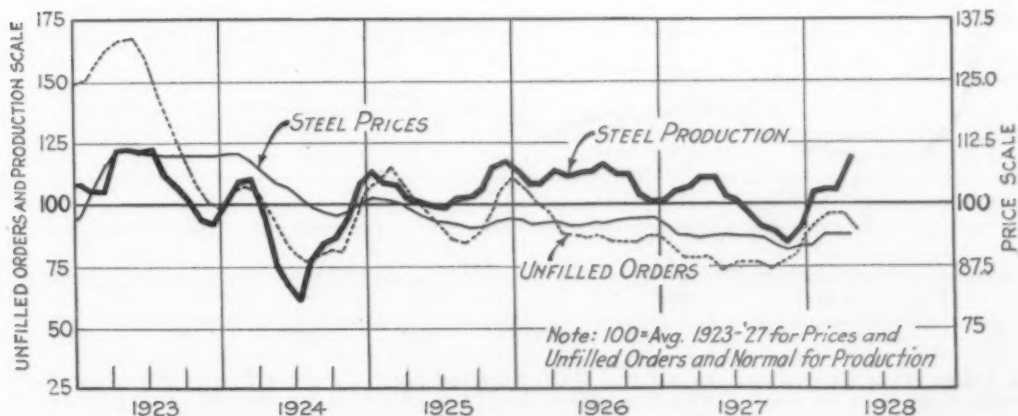
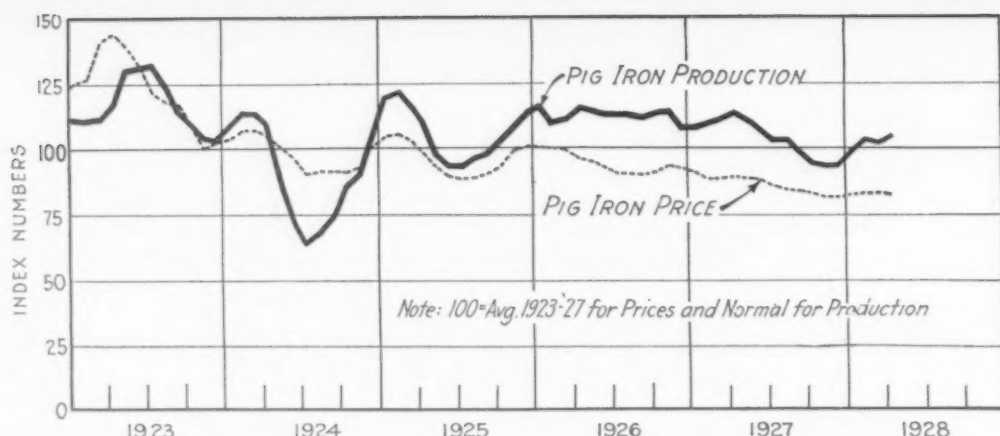




Fig. 2—Firmness in Pig Iron Prices Would Be Logical, with Pig Iron Output So Low Relatively to Steel. Pig iron today is decidedly cheap



in March. This is only 5 per cent above our estimate of the normal trend of pig iron production. Usually little change occurs in the average daily figure between March and April—if anything, a slight reduction being common. The April increase in production, therefore, represents a real upward trend, bringing our adjusted index to 105 against 102.1 in the preceding month. A year ago, however, the index was 113.9. Though so much below April, 1927, the pig iron output last month was at the highest annual rate, allowing for the small seasonal changes from month to month, that has appeared since last June.

Yet the April iron output was small compared with the steel figure, which, it will be remembered, showed an index of 119. The ratio of pig iron production to steel production, allowing for their respective normal trends, is the lowest found since 1922. In fact, if we are to assume any justification for the present level of steel production, it is hard to see why the pig iron output may not be called low and equally difficult to understand why pig iron prices should be so weak.

None the less, pig iron prices have continued to decline. The April average was \$17.67, which compares with \$17.73 in March and \$19.21 last year. At the present writing THE IRON AGE composite index is \$17.42, which is the lowest in a good many years. Pig iron is decidedly cheap. Perhaps there are two possible explanations for this condition. It may be that the steel situation is not so strong as the current high rate of ingot production would suggest—that the decline in new business and the weakness in steel prices is reflected in the price of the raw material. Or it may be that the pig iron market is particularly influenced by competition, including foreign competition.

In any event, it must be admitted that the trend of pig iron prices casts a rather unfavorable light on the present condition of industry in general. That prices of this basic commodity are so weak, in spite of so moderate a level of production, is a sad commentary on demand. Possibly it indicates the existence of considerable stocks of pig iron remaining over from the

second half of 1927, when pig iron output was excessive in comparison with steel making. In our opinion, the normal thing would be to find greater strength develop in the pig iron market in the near future. If such a development does not occur, that fact will be good evidence of fundamental weakness in the industry. It is significant that there has yet appeared no sign of strength. Even a 12-month moving average of pig iron prices continues to show a declining trend.

### Steel About on Par with General Prices

COMPARED with the general level of commodity prices, the average of finished steel appears to be quite reasonable. As measured by the Bradstreet index, the curve of commodity prices shown in the third chart is very close to the steel price curve and the two are running nearly parallel, with steel prices only a little below their average relationship to the general level. There is thus no indication given by this chart of any considerable early change in steel prices.

The most pronounced change shown in the chart is the rise in heavy melting scrap at Pittsburgh. This material averaged \$15.31 in April, against \$14.81 in March. At this writing the price is \$15.50. Nevertheless, we do not think that this temporary strength in the scrap market can be maintained. The decline in unfilled steel orders is significant in this connection. Also there is the relative cheapness of pig iron. The ratio of steel production to pig iron production is quite high, considering the level of steel prices, which is a condition that generally precedes a weakening in the scrap market. Finally, scrap is not particularly cheap in comparison with finished steel. Apparently there has been some covering of short sales made by scrap dealers, and this has affected the Pittsburgh market temporarily. A good many other markets show no strength.

In the case of finished steel, the weakness in sheets, strips and nails is noteworthy. Rarely is there such a decline in sheets and nails without weakness develop-

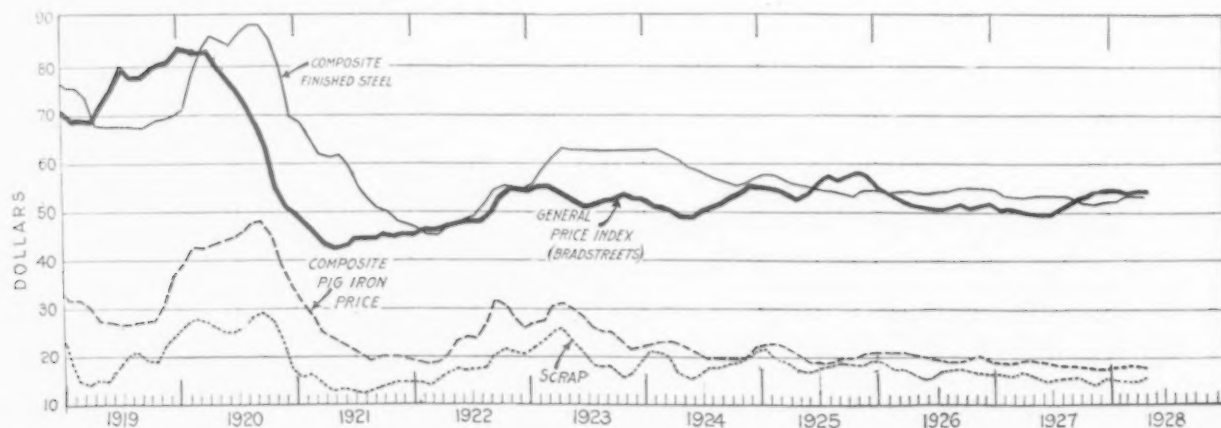


Fig. 3—Commodity Prices Have Been About on a Level With Finished Steel for Some Time. Finished steel price declines recently have been moderate. Pig iron prices may be unable to move upward so long as fuels and scrap remain low

ing also in steel bars. Billets, too, are likely to be affected unfavorably, and it seems that sheet bars can hardly escape the effect of the reduced demand and lower prices for sheets. It thus seems probable that, sooner or later during the next few months, price concessions on steel products will become more general, and that quoted prices when next tested by any large volume of buying will show declines.

### Eastern Steel Foundries Form Research Group

Realizing the importance of organized research work and in order to cooperate more closely with users of steel castings, a group of prominent eastern foundries has recently formed an association known as The Steel Castings Development Bureau, with offices in the Stock Exchange Building, Philadelphia. George Batty, a practical foundryman and metallurgist of many years' experience, has been appointed research director, and he will be assisted by J. V. McCrae, who, for some time, has been working as a research associate of the United States Bureau of Standards, Washington. The following are active members of the new organization:

Atlantic Steel Casting Co., Chester, Pa.  
Crucible Steel Casting Co., Lansdowne, Pa.  
Deemer Steel Casting Co., Newcastle, Del.  
Dodge Steel Co., Tacony, Pa.  
Empire Steel Casting Co., Reading, Pa.  
Eagan-Johnson Steel & Iron Co., Crum Lynne, Pa.  
Pennsylvania Electro Steel Casting Co., Hamburg, Pa.  
Riverside Steel Casting Co., Newark, N. J.  
Treadwell Engineering Co., Easton, Pa.

The bureau comprises manufacturers of steel by the open-hearth, converter and electric furnace processes, each having its own particular application in the steel foundry field.

Practical research work is already in progress on improvements in the process of manufacture, greater efficiency, and better castings; on possibilities in the use of alloy steel castings; heat treatment, resulting in improvement of physical properties, and general betterment of quality. Arrangements are also being made whereby users or probable users of steel castings can consult with the technical advisors of the bureau on any problems relating to the use or application of castings.

The research director, George Batty, will be available at the bureau's office for personal consultation on Fridays and Saturdays, and correspondence at any time is invited. The hearty cooperation and active help of the Bureau of Standards, Washington, has been secured and arrangements have been made, through the courtesy of the Bureau, for the group to have a permanent research associate stationed in Washington, where the full facilities of the Government's unique scientific appliances will be available.

### New Export Machinery Company

To aid American machinery manufacturers in the development of foreign markets, Paul H. Peterson, Inc., has been established with offices in the Graybar Building, New York. Through contact with dealers and distributors in foreign countries, the company will act as representative of American machinery builders, furnishing, when necessary, the finances to meet demands for long-term credits.

The new company will specialize in machine tools, railroad equipment, road building, textile, laundry, baking, shoe and sugar machinery and electric and hydraulic equipment. Paul H. Peterson, president, is an engineer, and was formerly export manager for Joseph T. Ryerson & Son, Inc., Chicago.

### \$12,000,000 FOR EXPANSION

#### Canadian Steel Company Plans to Develop Michipicoten Mines—Bounty and Higher Tariff Expected

The Lake Superior Corporation, Sault Ste. Marie, Ont., expects to spend approximately \$12,000,000 in the next two or three years, according to Robert Dodd, president of the corporation. The conversion of Michipicoten Harbor into a large coal distributing port by the building of coal docks, from which coal arriving by water can be distributed both east and west, and the building of a smelter at Michipicoten, were announced as part of the building program of the next two years. Other construction work will include the erection of a benzol plant, a skelp mill and a sheet mill. Construction work on the benzol plant will be started within two weeks, and the outlay will be approximately \$500,000. On improving the Michipicoten Harbor and erecting docks \$5,000,000 will be spent.

To fully complete the program the corporation has in view, Mr. Dodd said, some concessions were expected from the Canadian Government in the way of a better tariff and an iron ore bounty. One hundred million tons of ore have been blocked out at Michipicoten. At present it costs \$1 a ton more to treat the Michipicoten ore than is the case with the United States product, hence a large ore treatment plant will have to be built, and a fleet of vessels will be required to handle the Michipicoten business. Mr. Dodd further stated that \$5,500,000 will be spent on improvements and enlargements to the rail mill and merchant mills of the Algoma Steel Corporation.

"Everything will develop gradually," Mr. Dodd said. "If we get a tariff half as large as that enjoyed by the United States steel interests, we will have 10,000 people employed at the Soo within the next five or six years. Just now we are operating some of our branches at a loss, and others at a very small profit. We must get into competition with American steel, and just now we are endeavoring to hold our business until we can do so. We are losing money on merchant bars, alloy bars and splice bars, and are about breaking even on pig iron. The profits on rails are not large. The lack of a proper tariff is ruining the Canadian steel industry. A readjustment of the Canadian steel trade is coming within the next five years; commodities will be made where they can be manufactured the cheapest."

#### Bethlehem Steel Co. Producing 33-In. Beams and Girders

The Bethlehem Steel Co. has added to its line of wide-flanged structural shapes a series of 33-in. beams and girders, said to be the deepest sections ever rolled in the United States. The beams are available in four weights, ranging from 125 to 152 lb. per ft., and with section moduli respectively of from 394.3 to 478.4. The girders also are being rolled in four weights, of from 202 to 230 lb. per ft., and with section moduli respectively of from 676.0 to 778.0. These sections are designed to afford the maximum strength per pound of metal. They have the same contour as other Bethlehem sections.

The first of an eight-unit steam station on the Catawba River in Gaston County, N. C., has been started by the Duke Power Co. When completed, the station will be the largest in the Southeastern part of the United States. Each unit will develop 75,000 hp. The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., will furnish for the first unit two steam turbo-generators.

---

*Schedule of the next instalments of the Business Analysis and Forecast, by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows: June 14—Activity in Steel Consuming Industries; June 21—Position of Iron and Steel Producers.*

---

# CONTENTS

May 24, 1928

Bonus System for Foremen .....	1445
Foundrymen Meet in Birthplace .....	1448
Piercing Billets for Making Tubes .....	1466
Supply Associations May Combine .....	1470
Valleys Seek Ohio River Outlet .....	1473

Chicago's Industrial Museum.....	1465
Steel Treathers Elect Officers.....	1472
Cooperative Machinery Export Agency	1474
Freight Rate Cases .....	1475
Steel Foundry Research Group.....	1483
Canadian Steel Company to Expand...	1483
Bethlehem Makes 33-In. Beams.....	1483
Too Many Engineers?.....	1488
Reason for Larger Use of Steel.....	1488
Mechanization Has Helped Social Life.	1489
Vanadium-Titanium Pig Iron .....	1494
Salvage Conference to Be Held.....	1512
Steel Dwelling Construction in Germany	1514

## MEETINGS

American Foundrymen's Association ..	1448
National Supply and Machinery Dis- tributors .....	1470
Southern Supply and Machinery Dealers	1470
American Supply and Machinery Manu- facturers .....	1470
Gray Iron Institute.....	1476
American Society of Mechanical Engi- neers .....	1476
National Industrial Conference Board..	1489

## STATISTICAL

Coke Production at High Rate.....	1480
Foundry Equipment Orders Drop.....	1480

Wholesale Prices Up in April.....	1480
Decline in Steel Corporation Orders...	1480
Commercial Steel Castings.....	1480
Heavy Production of Steel Barrels....	1480
Automobile Production High in April..	1512
Steel Output Higher in Poland.....	1514
Swedish Iron and Steel.....	1514

## NEW EQUIPMENT

Internal Grinder .....	1477
Shankless Tool Bits and Holders.....	1478
Light, Rugged Portable Conveyor.....	1478
Electrically Heated Lead Pots.....	1478
Heavy-Duty Plain Grinders.....	1479

## DEPARTMENTS

Business Analysis and Forecast.....	1481
Editorial .....	1486
Correspondence .....	1488
Iron and Steel Markets.....	1490
Comparison of Prices.....	1491
Prices, Raw and Finished Products, 1493-1495	
Non-Ferrous Metals .....	1507
Railroad Equipment Buying.....	1508
Reinforcing Steel Business.....	1508
Structural Awards and Projects.....	1509
Personals .....	1510
Obituary .....	1512
European Steel Markets.....	1513
Machinery Markets .....	1515



# This Issue in Brief

Obtains better castings by molding with the heavier section at the top, instead of at the bottom. Appropriate gating is used so that the light sections at the bottom will be properly filled.—Page 1450.

Initiate your foremen into the mysteries of overhead and thereby cut your costs. Automotive equipment manufacturer gives foremen in both productive and non-productive departments a daily statement of items of controllable burden and labor expenditures. A bonus is paid for maintaining expense at a minimum.—Page 1445.

Pearlitic iron is over-rated, British foundry authority believes. Pearlite alone is no criterion of the suitability of the iron, he says. It is perfectly possible to obtain excellent pearlitic iron, and equally possible to obtain pearlitic iron poor in quality.—Page 1451.

Plug mill superior to Pilger mill in making seamless tubes, say equipment builders. Plug mill's output is two or three times higher; quality of product is better; equipment costs less, and maintenance costs are lower, they declare.—Page 1466.

Keeping labor contented depends largely upon the foreman. Correct leadership is the most important factor in low labor turnover. Workers want to be treated as human beings. Most so-called personnel work consists of frills and is ineffective, says personnel manager.—Page 1459.

Foundry authorities differ on value of test bars. They reveal what the casting will be, J. W. Bolton contends. Not so, says Doctor Moldenke, for cooling rate of the metal is an important factor.—Page 1451.

Scrap losses in malleable foundry cut almost in half by supervisory system. Each supervisor has about 18 molders under him. Every day each molder's output is counted, and defective castings inspected and classified. At the end of the week any molder or pattern with a bad record is discussed at the Saturday meeting of foremen.—Page 1458.

Paying a bonus on percentage of good castings cut down production, so this foundry installed a better system. Now, molders are paid piece work rates, plus a bonus for production. An extra bonus is paid monthly for the number of good castings made. Average must be at least 91 per cent to earn the extra bonus.—Page 1458.

To improve your cupola operation, measure your air by weight rather than by volume, says equipment builder. Weight of a cubic foot of air changes with temperature, and therefore blowers should be operated to deliver constant weight rather than constant volume. Too much air retards the melting operation.—Page 1452.

Mill supply houses' average distribution cost is 22.54 per cent. Their average net profit is only 0.5 per cent. To help raise this figure they want manufacturers to fix consumers' resale prices. Turnover has risen gradually and is now 4.13 times annually.—Page 1470.

Very existence is threatened, say Valley iron and steel producers, unless river transportation is made available. They urge Commerce Commission to permit P. L. & W. Railroad to build extensions down to Ohio River, to widen markets for Ohio Valley steel and to lower freight rates on incoming coal. Trunk line railroads fight the proposal.—Page 1473.

Sand reclaiming unit more than pays for itself in one month. It cost \$3,000, and is saving steel foundry \$3,500 a month, reducing new sand consumption from 1200 lb. to 300 lb. per ton of good castings.—Page 1453.

Molding sand's latent strength value is brought out by mulling, says metallurgist. Heavier mulling rolls give better distribution of clay, increase strength, and also break down the grain clusters.—Page 1456.

Don't permit salesmen to make prices. Distributors of mill supplies urge that selling prices be determined by a responsible executive in the house, and that cost figures be kept from salesmen.—Page 1470.

Condemns practice of selling castings by weight schedule. Knowledge of manufacturing costs will eliminate the schedule system, says foundryman. If the purchaser insists upon buying by weight rather than by units, quote a cost per ton for that particular pattern only.—Page 1458.

Fight to regain share of Pacific Coast business. Middle Western producers want rail rates cut, so that they may regain Coast business lost to Eastern producers when the Panama Canal was opened. Illinois Central Railroad is agreeable to reduction, and proposes to join with a steamship line, so that shipments may be made by way of New Orleans. Eastern producers offer spirited opposition.—Page 1475.

Doctor Haney sees no early change in finished steel prices. They are almost in line with the general level of commodity prices, and can hardly advance. Nor can they decline much from such a low level as now exists.—Page 1481.

ESTABLISHED 1855

# THE IRON AGE

A. I. FINDLEY, *Editor*

W. W. MACON, *Managing Editor*

Member of the Audit Bureau of Circulations and of  
Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York  
C. S. BAUR, *General Advertising Manager*

F. J. Frank, *President*

George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. A. C. Pearson, *Chairman*. F. J. Frank, *Pres.* C. A. Musselman, *Vice-Pres.* Fred O. Stevens, *Treas.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1402 Widener Building. Cleveland: 1362 Hanna

Building. Detroit: 7338 Woodward Ave. Cincinnati: 408 Union Central Building. Buffalo: 835 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St.

Subscription Price: United States and Possessions, Mexico, Cuba, \$6.00; Canada, \$8.50; Foreign, \$12.00 per year. Single Copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, N. Y., under the Act of March 3, 1879.  
PRINTED IN U. S. A.

## Schwab and Baldwin Are Right

**S**PEAKING in London last week Premier Baldwin dwelt on a note which Mr. Schwab had struck with force in his acceptance of the Bessemer medal at the hands of the Iron and Steel Institute a fortnight before. The great steel industry, with its immeasurable contribution to human progress in every land, with its long roll of triumphs in mechanical and metallurgical invention, is wrestling with poor success with the problem of winning an adequate return on its capital.

Mr. Baldwin, it need not be said, had the more doleful tale to tell. For himself, he had to say that for the vast investment he had made in the iron and steel properties of Baldwins, Limited, which are outstanding in the British industry, he had today only a penny for every shilling he had put in. Mr. Schwab, repeating in effect what he told the American Iron and Steel Institute last October, said that the great aim of the future, for steel producers, would be not the perfecting of costs of manufacture but of methods of distributing the steel so as to get a better price.

We draw attention now to these utterances of two men who are in the forefront in steel in Britain and America, to emphasize again what was said in an IRON AGE editorial of April 19 of the need of more and better publicity for steel. Premier Baldwin, with even an American sense of the remedy to which British steel makers must turn, said this:

It does look as though business and industry are groping toward a position in which businesses making the same kinds of goods will have to combine, at least for the purpose of pushing and advertising those goods and bringing new orders home. They are trying to do it in the coal trade. They will doubtless have a try at it in the steel trade.

At one and the same time steel producers on both sides of the water are seeing that if their industry is to make any real headway it must adopt marketing methods that will be as much ahead of the old as its production methods are ahead of those of 25 years ago. There is no real salesmanship in getting an order by the brute argument of a lower price than a competitor made. Too long has the

idea survived that steel is just steel, in the way that "pigs is pigs." The public, that has so much of its life tied up with things made from steel, that is moving every day in a world built of steel, eating nothing and wearing nothing that does not require equipment made from iron or steel for its production or transportation, must not go on believing that the industry to which it owes so much cannot win a fair reward for its unparalleled labors.

Steel makers should do much more to glorify their product and their service to modern life. The very psychology of all such effort would be of vast help in displacing the thought now uppermost in the public mind that the chief characteristic of steel today is its low and unprofitable price.

We firmly believe that President Schwab could raise no more enduring monument to his administration than by leading the American Iron and Steel Institute in this campaign to put steel in the high place which it has every right to hold in American life.

## Publicity Works for Both Old and New

**A**TENDANTS at the foundrymen's convention in Philadelphia last week had differing views of the outlook for the industry. One quoted Census statistics showing a consistent gain in the number of workers and the value of output. A. F. Jensen of Hanna Engineering Co., Chicago, speaking on behalf of the Foundry Equipment Manufacturers' Association, said that, while steel and malleable production per capita of population had increased largely in 25 years, gray iron founding had decreased 14 per cent in the same period. Apparently one's opinion depends upon the point of view; on whether the industry as a whole is visualized; whether one section appears to be backward; whether other groups are over-expanded; whether selling prices are low and return on investment unsatisfactory.

This condition within the foundry trade strikes such a parallel to that in the whole steel industry that Mr. Jensen's analysis of the conditions and recommendations of remedies may be applied to the broader field. He says that those business groups which have studied their fields intensively,

adopted a sound merchandising plan and backed it with correct publicity, have been the ones to get a goodly share of the profitable business. But it is essential to know the field, know the product, and tell the world about it.

This matter of publicity will bear more emphasis. It has helped establish so many new things in the market. Yet seldom does any one think it may be used effectively to retain the market position of the old favorites. Refrigeration is a case in point. Where would Frigidaire, G. E., Kelvinator and the other refrigerating units be if their manufacturers had not taken pains to tell the world about the new idea? The ice men were first amused, then interested; and now, worried, they are campaigning (with publicity as a principal weapon) to impress the public with the obvious fact that a block of ice never gets out of order, and it doesn't cost very much.

In this age of rapid changes and easy money, a novelty is quickly seized upon. The old fashioned is readily replaced. New products, new uses, new operations are widely discussed and get much attention because of the novelty. In the competition between metals, iron and steel has suffered at the hands of aluminum. Aluminum—the "metal from clay"—and its many light strong alloys, is always interesting. Any one would read or listen to the story of making a railroad car of aluminum. Making it of steel is an old, outworn tale. Yet it is very important that railroad men especially and the public generally be reminded frequently that steel is the material from which railroad cars are being built; steel in passenger coaches has saved thousands of travelers' lives; steel in freight cars has handled America's trade.

Sound publicity about steel and iron is needed by all branches of the industry, and by the industry as a whole. Some few branches have made a start, are pointing the way. A broader, more intensive effort is necessary. Sound publicity includes not only the dissemination of information about the new uses for steel and iron but participation in society and trade meetings where competing materials are likely to be discussed. Parallel data should be presented by competent persons to show comparative qualities of the old reliable materials. Conferences, lectures and data sheets for engineering and technical colleges, for trade and manual training schools, are of greatest importance in teaching the coming generation about the excellencies of steel and iron.

These are a few of the things included in publicity, as well as an effort to feed out through every available channel appropriate, well written and attractive matter about the strength, reliability, and honorable history of iron and steel—iron, the most important material underlying our present mechanical civilization.

This is a big job—too big for anything but the united effort of the entire industry.

IT might well have been stressed at the reunion of the charter members of the American Foundrymen's Association at Philadelphia last week that the association has been peculiarly fortunate in its secretaries. John A. Penton, the first of the four, was a master promoter and organizer. Then came Dr. Richard Moldenke, master technician, who in

his 14 years made the A. F. A. influential at home and throughout the foundry world of Europe. A. O. Backert, whose untimely death was widely lamented, showed himself a master builder whose boundless energy and unflagging industry were always at the association's command. And now for a decade C. E. Hoyt, master manager and developer, conserving all that his predecessors had wrought, has been opening up new fields, bringing the association to an eminence beyond the liveliest imaginings of the founders.

## Automobile Demand in Future

A FEW years ago it was merely a pastime to attempt to guess the future of automobile demand. Now, with an accumulation of annual statistics of production and registration, and a reasonable assumption as to the cars scrapped, there is some definite light. Considering only the statistics of production, an editorial in *THE IRON AGE* of April 26, 1928, concluded that "the figures suggest that large gains in automobile production disappeared quite a while ago."

The complication produced by the cessation of Ford production was largely eliminated by comparing production in twelvemonth periods ended March 31 instead of Dec. 31. The largest twelvemonth was that ended March 31, 1926.

Now we have a very interesting table for study in "Facts and Figures," 1928 edition, just published by the National Automobile Chamber of Commerce, page 24. This covers passenger cars and trucks for the United States. Production is given, exports deducted, and the United States market thus ascertained. Then registration is given, and finally there is a computation of the number scrapped.

These columns of figures, 1913 to 1927 inclusive, increase in quite different ways. They all move more by geometrical than arithmetical progression. In percentage, production increased rapidly, but registration still more rapidly, as cars were piling up, so to speak, while scrapping increased still more rapidly, because there were more and more cars to wear out. Taking 1919 and 1926 as convenient years for the illustration, production increased 112 per cent, registration 190 per cent and scrapping 346 per cent.

The "Facts and Figures" table is accompanied by a diagram, which shows average car life to have been about five years in the early period, to have increased to seven years afterward, and to have remained at just seven years for about five years past. On an average cars pass through two or three ownerships and it is hard to believe that the average life will remain at only seven years.

To avoid being misled by figures, on the geometrical scale, going up faster in registrations than in production, and faster still in scrapping, we make another computation, which shows a slow increase, the percentage scrapped in a given year to the production of that year, thus:

Cars and Trucks Scrapped in Percentage of Production			
	Per Cent		Per Cent
1920.....	17.4	1924.....	34.6
1921.....	32.6	1925.....	43.5
1922.....	34.3	1926.....	46.9
1923.....	22.9	1927.....	68.1

The last named figure is not significant, as the scrapping had to be one-half estimated, while the number was put in relation to a light production.



With the percentage failing to increase sharply of late, the stimulus to production fails to increase as formerly. These geometrical progressions, so impressive for years, have really disappeared long enough ago for the disappearance to be visible in the statistics if sufficient study is made. The question is whether there will be even much arithmetical increase in production after the probable large Model T mortality has been offset.

### Capital In Carrying Stocks

**C**OMMENT on the large amount of brokers' loans used in the carrying of securities has been chiefly to the effect that the amount is excessive and something ought to be done about it. Last week's report (on Wednesday) showed that these loans amounted to four and a half billion dollars, and then on Thursday the New York Federal Reserve Bank raised its rediscount rate from 4 to 4½ per cent.

The phenomenon is worthy of consideration from another standpoint, that of capital. Margins are large, and assuming for convenience that they are one-third, we have two and a quarter billions involved in margins, or a total of six and three-quarter billions. Whether or not the share market has a big slump, the four and a half billions of capital will be intact. As to the other two and a quarter billions, it is capital now and may remain as such. The holders on margin expect to do one of two things—either to sell out to others, who thereupon would be investing capital, or gradually to pay off the loans so as to be outright owners of the shares. In either case the existence or creation of additional capital is presupposed.

Then there are our loans abroad, constantly growing and presumed to represent investment of

capital newly created. Like the brokers' loans, they have been widely criticized, and in both cases the inference is clear that the capital goes where it does because it has less inducement to go elsewhere. Capital has been in process of creation in excess of the requirements of commerce as commerce has lately been conducted.

In the past, advances in the share market have run into scarcity of loanable capital, whereupon it appeared that the needs of commerce called for the available capital. We seem to have before us a situation in which the pressure will be in the opposite direction, capital calling upon commerce to expand to provide a use for it, instead of an expansion in commerce calling for capital to come out of the stock market.

That commerce as a whole does need a stimulus has been obvious. By growing efficiency in the old lines of manufacture and service, labor has been released and new lines of activity are needed. In the past as such things came out they sought capital. The tendency now is for capital to seek them.

The human element is not to be disregarded. Many observers claim that people have been speculating because it was easier, and seemed more profitable, than productive work. They may find it is better to work. That will be the case if share values continue advancing, for dividends as a rule are not increasing and yields accordingly would decrease. With more disposition on the part of such people to work, and with capital calling for new work to be done, there are auguries for commercial expansion in the next few years. By no means, of course, is this the whole story, or the greater part of it, but these clear points may be set against such auguries as are considered unfavorable.

### CORRESPONDENCE

#### "Too Many Engineers?"

*To the Editor:* I regard the editorial under the above title in THE IRON AGE of May 17 as the ablest presentation and analysis of this very debatable question I have ever read. I believe a great deal of the difficulty lies with the technical universities, in that they regard engineering as the alpha and omega of the careers of all the students they graduate. If they would more frankly expound the idea that engineering is one of the best stepping stones to higher executive positions, we would not have the unfortunate situation of men hesitating to accept opportunities with greater possibilities, merely because it means scrapping the direct application of their detailed engineering education which they have been taught to value so highly.

Engineering principles and methods of reasoning and analysis, rather than detailed application of formulas and rules, are the real heritage of an engineering education. If the universities will thus amend their attitude, the graduation of engineers into higher executive positions not directly concerned with engineering will be tabulated as a gain rather than a loss in statistics regarding former students.

It is unfortunate that practically all engineering societies are more concerned with the advancement of the technical knowledge of their profession rather than with the financial advancement of their members. To say that any concerted effort to better the financial rewards of engineers is unprofessional, as some societies do, puts their officers in an embarrassing light, in that the eminent engineers who head these societies are

by virtue of their own standing the very men who are likely to be the direct employers of the junior engineers who seek this financial advancement. It is much better to correlate this "proper reward for services rendered" program with the professional program of the existing engineering societies than to permit it to organize as a separate movement with increased remuneration as its sole objective.

If this situation is forced upon the rank and file of engineers, such an independent movement may unfortunately pattern itself too closely after labor union organizations. If, however, it is sincerely fostered by the engineering societies now in existence, it will not be likely to be conducted in an unprofessional or unethical manner, or be overemphasized, but will be a coordinated part of a real engineering program.

JOHN F. HARDECKER.

Philadelphia, May 18.

#### A Compelling Reason for Larger Use of Structural Steel

*To the Editor:* Your editorial on "Over-Capacity and Competition" is a pleasing contrast to the usual articles of pure economists, who apparently assume that the supply and demand can be represented by two tanks partly filled with water which can be equalized by simply turning off a valve.

You make the point more clearly than I have ever seen it stated elsewhere that capitalization of enterprise must be kept going and that the economic corrective is delayed on that account and it is this continued excess capacity that is the most serious element of the situation.

The one additional step that can be taken by an industry finding itself in an over-capacity situation is to increase the use of its products, a point which has

been emphasized many times by THE IRON AGE.

Recently in our own structural shop I saw some large 14-in. rolled H columns weighing about 300 lb. per lineal ft. with flanges 2 1/4 in. thick being fabricated in lengths of 70 ft. without a splice. Prior to the use of this rolled H section it was the practice to order a 14-in. web plate, four flange angles and four 14-in. cover plates, each of which had to be punched and

painted and finally assembled and riveted to give the same final section that we now get in a rolled shape from the mill. This is a fair sample of increased capacity in fabricating shops that has developed almost unconsciously, and the only solution is a larger use of structural steel such as you have long advocated.

H. H. COSLEY,  
Contracting Engineer  
Mississippi Valley Structural Steel Co.  
Chicago, May 15.

## Mechanization of Industry Has Helped Social Life

Magnus W. Alexander Tells National Industrial Conference Board  
That Our Progress Has Been Other Than Economic—  
America's Position in World Finance

AMERICA has been leading the world in the intensive mechanization of industry and its national prosperity is due in large measure to that circumstance, declared Magnus W. Alexander, president National Industrial Conference Board, when he addressed the members of the Conference Board at its twelfth annual meeting at the Hotel Astor, New York, last week. The great increase in national income and wealth in recent years, the high wage levels and particularly the high purchasing power of American wages he attributed to standardized, highly mechanized production, emphasizing that the substitution of power and machines for hand labor, far from reducing employment, in the long run increases the opportunities for employment.

Great significance was attached by Mr. Alexander to the beneficial effects of the mechanization of industry upon social life. The resulting economic gain, which has made it possible to combine a high wage level with relatively low price levels, he declared, accounts for high standards of living and shorter working hours. The resultant high wage earnings and increased leisure, he pointed out, enable the American wage earner to devote more time to cultural pursuits than workmen in most other countries are able to do. Mechanized industry's increasing demand for men and women with more knowledge and training and the correlative desire for more education among all classes, he declared, is not only developing a new type of workers, but also tends to evolve a more homogeneous population. Even the content of the immigration stream during recent years, he pointed out, reflected the greater demand in the United States for persons with professional training, while there had been a marked falling off in the influx of common labor.

Mr. Alexander deplored the wide publicity given to unemployment estimates during recent months. Asserting that the wide discrepancy of various estimates, ranging from less than 2,000,000 to 8,000,000 unemployed persons, in itself was evidence of the unreliability of estimates of unemployment and of the inadequacy of the available statistical material for such calculations, he warned against accepting as fact pure assumptions, the propagation of which is exerting a definitely deterrent influence on business progress.

### America's Position in World Finance

Discussing the bearing of the international creditor position of the United States upon American industry and trade, Virgil Jordan, chief economist of the Conference Board, said that "in view of the vast responsibilities which rest upon the United States in international finance and trade, it is not safe or wise to rely altogether upon one or the other of the conflicting answers which economic theory gives to the difficult questions of the future, or upon the naive hopefulness that everything will come out right in the end. It has been wisely said that the best road to bankruptcy is a good tip and a fat pocketbook, and both of these the United States has in abundance today.

"Being the world's greatest creditor nation involves a great deal of hard work and constant worry, some of which is done for us by the Government, but most of which necessarily falls upon private citizens and groups of citizens of many different kinds. This does not mean that we are doomed to work like the devil to collect our foreign debts or to worry about how they will be paid

back. Only very naive people trouble themselves about things like that, for of course these debts will never literally be paid back. They are not debts or loans but investments, and even in the case of war loans and reparations, the problem that faces us is not how to collect them but how to scale them down so that they can safely be absorbed by private investors and converted into sound public investments. They will be funded and refunded and spread over the investing public of the world, but no one wants them paid back 'til Judgment Day, when it will no longer matter whether they are or not.

"All that we are interested in is the stability of their value and their yield; and this means simply that we are interested in the business operations of which they are the basis. The so-called creditor position of the United States means simply that we have engaged on a large scale in foreign enterprise. Being the largest creditor nation implies the obligations and responsibilities of running the largest international business, which is the most difficult kind of business to conduct successfully. Historical precedent and current opinion are not reliable guides in a situation so new, vast and complex as that which now faces us. We shall have to approach these problems with an open mind and with a desire to know fully the facts, conditions and tendencies as they exist. Above all, we must be on our guard against the uplifting sentimentality about the duties and responsibilities of the United States in relation to the welfare of the rest of the world, an attitude which is widely prevalent today in America in connection with these questions."

### Overhauling of Anti-Trust Laws May Be Demanded

Diminishing profits and the increasing difficulty of many small and medium-sized manufacturers and distributors to maintain themselves, in the face of the mass production and the mass distribution of their stronger competitors, are developing a feeling of unrest that politically may translate itself into a concerted demand for overhauling all of our present anti-trust laws, according to Gilbert H. Montague, member of the New York bar, who addressed the Conference Board. He said:

"Prosperity, so long as it continued at high tide, temporarily took the anti-trust laws out of politics, and kept them out of politics longer than anyone could have anticipated, but disappearing profits on the part of a growing number of small and medium-sized manufacturers and distributors, and increasing clamorous criticisms on the part of a growing number of particular groups and interests, may soon bring the anti-trust laws back into politics again."

### Considerable Obsolete Machinery Still in Use

In spite of the rapid and radical progress made particularly during the past decade in automatic machinery, which has helped to reduce production costs in many instances to a fraction of what it is when obsolete machinery is used, approximately 44 per cent of machine equipment used in the metal-working field today is more than 10 years old, declared K. H. Condit, editor of the *American Machinist*. Labor saving machinery, Mr. Condit said, will return its purchase price in from five years to as many weeks and sometimes less, yet many makers of such machinery find it difficult to make profits.



# Iron and Steel Markets

## Steel Production Tapering

Mill Operations in Greater Pittsburgh District Decline to  
75 Per Cent—Valley Basic and Bessemer Pig  
Iron Drop 50c.

MILL operations are tapering, but the gradual character of the decline is testimony to the large volume of steel passing directly into consumption. With prices no longer buoyant, consumers are ordering sparingly and, in some instances, are delaying purchases in the hope of buying more advantageously later. This spirit of caution is reflected not only in new business, but in a reduction in the average size of individual specifications. Shipping orders in the aggregate, however, show surprisingly little change.

Steel output in the Greater Pittsburgh district has dipped to 75 per cent, compared with a recent rate of 80 per cent of capacity. At Chicago, where production has been holding at 95 per cent, there has been virtually no curtailment to date. Average operations of Steel Corporation subsidiaries are now placed at 85 per cent, a decline of three or four points in the past week.

The volume of tonnage still reaching the mills is all the more impressive when the uneven tendencies of consumption are considered. Makers of wire products are feeling the overstocked condition of jobbers, particularly in nails. Business in steel pipe is making a poor showing compared with recent years. The decline in demand for oil country pipe is marked, even in comparison with last year, when first quarter shipments satisfied most of the first half requirements. Railroad equipment orders are disappointing, and the consumption of hot-rolled bars by makers of cold-finished bars and bolts, nuts and rivets has declined, bolt and nut output being 10 per cent lower than a month ago.

On the other hand, tin plate demand remains active, supporting mill operations well above 90 per cent of capacity. Specifications for automobile steel are undiminished and, with the exception of one or two companies, there has been no slowing down in motor car output. Ford's bar requirements now exceed the capacity of his own mill, and an increasing tonnage is being bought in the open market. At Chicago new business in soft steel bars is equal to shipments and alloy steel bar mills are running at capacity.

Specifications for automobile body sheets remain heavy. Some interruption in the flow of steel to motor car plants is expected, however, in about 30 days, when new models will be brought out.

The structural steel outlook continues good, although awards of fabricated work for the week were light. At New York fully 90,000 tons of new work will come up for bids before mid-summer, and at Chicago 50,000 tons for a single project will probably be placed by the middle of June.

Prices of finished steel, in view of the small amount of new business, show little change. Recent

minimum prices on black and blue annealed sheets are becoming more general, and galvanized sheets have dropped another \$1 a ton to 3.55c., Pittsburgh. On 6 to 12-in. hot-rolled strip 1.75c., Pittsburgh, or \$1 a ton under the recent base, is more commonly quoted.

Alloy steel bar mills have increased the differential on Series 3200 nickel chromium steel bars \$7 a ton. The advance represents a readjustment to bring a particular grade more nearly in line with other grades.

Prices of primary materials continue to give ground. Basic and Bessemer pig iron have declined 50c. a ton in the Valleys and Cleveland malleable and foundry grades have receded 25c. to 50c. for delivery to competitive districts. The Michigan market on foundry and malleable iron, which has held at \$18 a ton, furnace, for some time, is now represented by a range of \$17.50 to \$18. At Pittsburgh heavy steel scrap has dropped 50c. a ton.

The Virginian Railway has bought 1000 hopper car bodies, and the Erie Railroad has ordered 35 locomotives. The Wheeling & Lake Erie has placed a supplementary order for 1000 tons of rails, and a Western road has bought 4000 tons. Rail mills at Chicago continue to operate at 90 per cent, but diminishing backlogs point to an early curtailment.

Merchant producers of pig iron are encountering increasing competition from steel company furnaces as steel output tapers. Weakness in scrap prices, by stimulating the use of old material in open-hearth furnaces, has also released more steel works pig iron for the open market. The drop of 50c. a ton on basic and Bessemer pig iron in the Valleys brings these grades to the lowest levels since the fall of 1915. The reduction in Valley basic was brought out by a 25,000-ton inquiry from a steel company.

At Chicago, pending third quarter business in foundry iron totals 30,000 tons, and smaller amounts are under consideration at other points. The pig iron situation in the Chicago district is being watched anxiously, following the arrival of cargoes of hematite iron from England and foundry iron from Lake Erie ports.

Bookings of fabricated structural steel fell off in April from March in the ratio of 69 per cent of capacity for March to 63 per cent for April. Fabricated steel plate work, on the other hand, bulking roughly one-fourth the volume of fabricated structural steel, showed an increase from 57 per cent of capacity in March to nearly 61 per cent in April.

For the third successive week THE IRON AGE pig iron composite price has reached a new low level. It is now \$17.34 a ton, the lowest figure since 1915. Finished steel remains for a third week at 2.348c. a lb.



# A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics  
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	May 22, 1928	May 15, 1928	Apr. 24, 1928	May 24, 1927
No. 2 fdy., Philadelphia....	\$20.76	\$20.76	\$20.76	\$21.76
No. 2, Valley furnace.....	17.25	17.25	17.25	18.50
No. 2, Southern, Cin'tl.....	19.19	19.19	19.69	21.69
No. 2, Birmingham.....	15.50	15.50	16.00	18.00
No. 2 foundry, Chicago*....	18.00	18.00	18.50	20.00
Basic, del'd eastern Pa....	19.00	19.00	19.50	20.75
Basic, Valley furnace....	16.00	16.50	17.00	18.00
Valley Bessemer, del'd P'gh	18.76	19.26	19.26	20.76
Malleable, Chicago*.....	18.00	18.00	18.50	20.00
Malleable, Valley.....	17.25	17.25	17.25	18.50
Gray forge, Pittsburgh....	18.51	18.51	18.51	19.76
L. S. charcoal, Chicago....	27.04	27.04	27.04	27.04
Ferromanganese, furnace...	105.00	105.00	100.00	95.00

Rails, Billets, Etc., Per Gross Ton:	May 22, 1928	May 15, 1928	Apr. 24, 1928	May 24, 1927
O.-h. rails, heavy, at mill...	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh...	33.00	33.00	33.00	33.00
O.-h. billets, Pittsburgh...	33.00	33.00	33.00	33.00
O.-h. sheet bars, P'gh....	34.00	34.00	34.00	33.50
Forging billets, P'gh....	38.00	38.00	38.00	39.00
O.-h. billets, Phila.....	38.30	38.30	38.30	39.30
Wire rods, Pittsburgh....	44.00	44.00	44.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.85	1.85	1.85	1.80

Finished Iron and Steel,	May 22, 1928	May 15, 1928	Apr. 24, 1928	May 24, 1927
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.12	2.12	2.12	2.12
Iron bars, Chicago.....	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh...	1.85	1.85	1.85	1.85
Steel bars, Chicago.....	2.00	2.00	2.00	2.00
Steel bars, New York....	2.19	2.19	2.19	2.19
Tank plates, Pittsburgh...	1.85	1.85	1.85	1.85
Tank plates, Chicago.....	2.00	2.00	2.00	2.00
Tank plates, New York...	2.17½	2.17½	2.17½	2.19
Beams, Pittsburgh.....	1.85	1.85	1.85	1.80
Beams, Chicago.....	2.00	2.00	2.00	2.00
Beams, New York.....	2.14½	2.14½	2.14½	2.14
Steel hoops, Pittsburgh...	2.20	2.20	2.20	2.30

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	May 22, 1928	May 15, 1928	Apr. 24, 1928	May 24, 1927
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.70	2.70	2.75	2.90
Sheets, black, No. 24, Chi-				
cago dist. mill.....	2.80	2.80	2.85	3.10
Sheets, galv., No. 24, P'gh	3.55	3.60	3.65	3.75
Sheets, galv., No. 24, Chi-				
cago dist. mill.....	3.70	3.70	3.70	3.95
Sheets, blue, 9 & 10, P'gh	2.00	2.00	2.00	2.25
Sheets, blue, 9 & 10, Chi-				
cago dist. mill.....	2.15	2.15	2.15	2.35
Wire nails, Pittsburgh....	2.55	2.55	2.65	2.50
Wire nails, Chicago dist.				
mill.....	2.70	2.70	2.70	2.55
Plain wire, Pittsburgh....	2.50	2.50	2.50	2.40
Plain wire, Chicago dist.				
mill.....	2.55	2.55	2.55	2.45
Barbed wire, galv., P'gh...	3.35	3.35	3.35	3.20
Barbed wire, galv., Chi-				
cago dist. mill.....	3.40	3.40	3.40	3.25
Tin plate, 100 lb. box, P'gh	\$5.25	\$5.25	\$5.25	\$5.50

Old Material, Per Gross Ton:	May 22, 1928	May 15, 1928	Apr. 24, 1928	May 24, 1927
Heavy melting steel, P'gh...	\$15.00	\$15.50	\$15.25	\$15.50
Heavy melting steel, Phila.	13.50	13.50	13.50	14.00
Heavy melting steel, Ch'go	13.00	13.00	13.00	12.25
Carwheels, Chicago.....	13.50	13.50	13.50	13.75
Carwheels, Philadelphia...	15.50	15.50	15.50	16.00
No. 1 cast, Pittsburgh....	14.50	14.50	14.50	15.50
No. 1 cast, Philadelphia...	16.00	16.00	16.00	16.50
No. 1 cast, Ch'go (net ton)	14.00	14.00	14.00	15.50
No. 1 RR. wrot. Phila....	15.00	15.00	15.00	16.50
No. 1 RR. wrot. Ch'go (net)	11.75	11.75	11.50	11.00

Coke, Connellsville, Per Net Ton at Oven:	May 22, 1928	May 15, 1928	Apr. 24, 1928	May 24, 1927
Furnace coke, prompt....	\$2.60	\$2.60	\$2.60	\$2.90
Foundry coke, prompt....	3.75	3.75	3.75	4.00

Metals,	May 22, 1928	May 15, 1928	Apr. 24, 1928	May 24, 1927
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	14.02½	14.37½	14.25	12.87½
Electrolytic copper, refinery	14.25	14.12½	14.12½	12.43
Zinc, St. Louis.....	6.15	6.05	5.82½	6.07½
Zinc, New York.....	6.50	6.40	6.17½	6.42½
Lead, St. Louis.....	5.97½	6.00	6.00	6.15
Lead, New York.....	6.10	6.10	6.10	6.50
Tin (Straits), New York...	51.50	52.50	52.62½	67.75
Antimony (Asiatic), N. Y.	11.00	11.25	10.12½	13.50

## Pittsburgh

### Basic and Bessemer Pig Iron 50c. Lower —Steel Output Tapers Slightly

PITTSBURGH, May 22.—Not much change is noted in the aggregate rate at which steel orders and specifications are coming to local manufacturers, as a slowing up in the demand for some products is quite fully compensated by gains in others. Wire products are not doing nearly as well this month as they did last month, but it is quite uniformly reported by strip makers that this month's business is running about 10 per cent ahead of that of last month. The past week's releases against orders for bars, plates and shapes ran a little ahead of those of the week before. Tin plate is holding to a high rate of production and movement, but pipe business, although enjoying occasional spurts, appears to be gradually decreasing in volume. The automobile steels still are doing well, car builders being rather anxious to obtain shipments to complete production schedules on present models and get ready for the new series, which will begin to reach the market in the next 60 days. But whether it is automobile steel or steel for other uses, the tonnage moving is chiefly against old orders.

As strictly new steel business is very light, order books have dwindled to a point where some curtailment of ingot production has been found necessary. The average this week for this and nearby districts is closer to 75 per cent than to 80 per cent, the rate of a week ago.

Steel prices show no particular change, inquiries

being too few and small to furnish real tests. Pig iron prices, however, have yielded, for which merchant producers are inclined to blame the steel makers, who have been consuming iron rather sparingly, using scrap freely, thus having rather sizable surplus supplies of iron which they have been forcing on the market.

**Pig Iron.**—The Valley-Pittsburgh market clearly is weaker and 50c. per ton lower on the steel-making grades. On the large basic iron inquiry which appeared about 10 days ago, \$16, Valley furnace, has been quoted, a drop of 50c. a ton from the recent nominal quotation. Incidentally, that price was not interesting to the company seeking the iron, as it has an even lower delivered price than \$16 at any of the Valley furnaces would mean. Moreover, a Pittsburgh district steel maker has bought within the week a good-sized lot of this grade at close to \$17, delivered, and the iron carries a freight rate that will mean a price at the furnace, from which it is believed the iron is coming, of about \$15.25. Bessemer iron is offered at \$17, Valley furnace, also a drop of 50c. a ton from its recent price, which, while still being quoted, is sustained only by carload lots. Foundry and malleable grades are holding at recent prices, being somewhat freer of steel company competition than is true of the steel-making grades. Steel company production of pig iron is large by comparison with consumption. The pig iron market also is affected by the weakness of scrap prices, which stimulates the use of old material and makes steel company pig iron available for the market. Except for the activity in basic iron, the business again in the past week has been chiefly for one and two carload lots. The Richmond Radiator Co., Uniontown, Pa., is

in the market for 5000 tons of foundry iron for third quarter shipment.

Prices per gross ton, f.o.b. Valley furnace:

Basic .....	\$16.00
Bessemer .....	\$17.00 to 17.50
Gray forge .....	16.75
No. 2 foundry.....	17.25
No. 3 foundry.....	16.75
Malleable .....	17.25
Low phosphorus, copper free.....	26.50

Freight rate to the Pittsburgh or Cleveland district, \$1.76.

**Ferroalloys.**—British makers of ferromanganese appear to have written a good deal of business for delivery during this quarter prior to the recent advance to \$105, and with consumers generally well covered at the old price to the end of July and able to enter specifications for August shipment at \$100, there has been no urge to sign second half contracts. Except for steady deliveries on contracts, there is little of interest in the other commonly used ferroalloys.

**Fluorspar.**—Although the price of gravel spar is higher at mines than it was earlier in the year, the delivered price in this district is substantially the same. The company which has obtained most of the recent business is shipping it by river barge, the rate being \$3 a ton, against \$5.25 per ton by rail. It is estimated that close to 10,000 tons has been booked in this district and will move by river to destinations, the sales including one of 3700 tons. This company now is quoting \$16.25 on barge, the price including a handling charge of 25c. a ton. Companies obliged to ship by rail would have to make a price of \$14, mines, to match a barge delivered price of \$19.25.

**Semi-Finished Steel.**—Makers of sheet bars here and in Youngstown are making an effort to establish firmly a price of \$34 on contracts; while that price has long been the open quotation, producers were not always rigid in their insistence upon the full amount. Most companies making sheet bars for sale also roll sheets and the firmer stand on sheet bars is believed to be prompted by the desire to stop the decline in the latter. There is only moderate activity in sheet bars, but rolling mills are specifying rather well for billets and slabs. Skelp is also moving steadily on contracts. The prevailing price on wire rods is \$42, base Pittsburgh, although a good many contracts have been written at \$44, base, and there is some specifying against contracts for high carbon and acid open-hearth rods carrying the latter base.

**Bars, Plates and Shapes.**—Releases against old orders are making a creditable showing in the aggregate, but new business is not equaling completed orders. Backlogs, principally of bookings made late in March, are dwindling. It requires sales effort to bring in specifications as well as new business, because consuming demands are not as large now as they were earlier in the month. Bars are affected by the recession in bolt, nut and rivet business and in the demand for cold-finished bars. Plate tonnage is not heavy and fabricated steel inquiries, though fairly numerous, are

small individually and in the aggregate. In the territory dominated by Pittsburgh district mills through favorable freight rates, the market is firm at 1.85c., base Pittsburgh, on these products.

**Rails and Track Supplies.**—Steady deliveries on old orders do not help the outlook much, since there is a dearth of new buying. Inquiries for light-section rails are usually for single carloads. The market for small spikes still waits on some definite improvement in coal mine operations. Prices are steady.

**Wire Products.**—Makers still find business slow, although there is some evidence of a larger movement into consumption. Scarcely enough business is being quoted on to establish prices definitely, but the larger manufacturers continue to regard the market as \$2.65, base, per keg, Pittsburgh, for nails and \$2.50, base, per 100 lb. on plain wire. However, the report continues, nails can be bought at \$2.55, base; seemingly, some makers are content with that price plus the new card of extras, which produces a price of \$2.77½ per keg for 20 to 60 pennyweight nails, making allowance for the 10 per cent discount on the extras for carload lots.

**Tubular Goods.**—Pipe business is running behind the volume at this time last year and is making a rather poor showing compared with the average of the past few years to this date. Standard-weight pipe is going out fairly steadily, but there is not much activity in line pipe, and there are suggestions that the demand for gas does not indicate the need of the laying of some of the long lines that have been talked of for some time. The deficiency in oil country pipe business, even compared with that of a year ago, is fairly marked, and it will be recalled that last year the first quarter shipments proved sufficient for most of the first half's requirements. A revision of lapwelded steel boiler tube prices is in the making.

**Sheets.**—Automobile body sheets still are moving actively, but there seems to be some doubt that the demand will continue much longer at the present rate, since the releases now are against present series models and new models of most cars are due to appear in the next 60 days. While the new cars will call for the ordering of sheets, a gap in specifications usually occurs when the engineers make their last minute changes in designs. Metal furniture sheets are doing well. The ordinary finishes are slow. The flexibility in prices has not stimulated buying. The market on galvanized sheets is very weak. Those for uses other than roofing and siding can be fairly quoted at 3.60c. to 3.65c., base Pittsburgh, but lower figures are coming out on roofing and siding sheets, particularly in the South, where exists the largest market for them.

**Tin Plate.**—Makers are well satisfied with the way contracts are being specified. That releases are large is indicated by the fact that mill operations of leading producers are well above 90 per cent of capacity. Counting in its Pittsburgh works, which probably will not be operated again, the American Sheet & Tin Plate Co. is running at 91 per cent of capacity.

**Cold-Finished Steel Bars and Shafting.**—Orders are

## THE IRON AGE Composite Prices

### Finished Steel May 22, 1928, 2.348c. a Lb.

One week ago.....	2.348c.
One month ago.....	2.355c.
One year ago.....	2.367c.
10-year pre-war average.....	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1928	2.364c.,	Feb. 14:	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4:	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5:	2.403c.,	May 18
1925	2.560c.,	Jan. 6:	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15:	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24:	2.446c.,	Jan. 2

### Pig Iron

#### May 22, 1928, \$17.34 a Gross Ton

One week ago.....	\$17.42
One month ago.....	17.67
One year ago.....	19.04
10-year pre-war average.....	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1928	\$17.75,	Feb. 14:	\$17.34,	May 22
1927	19.71,	Jan. 4:	17.54,	Nov. 1
1926	21.54,	Jan. 5:	19.46,	July 13
1925	22.50,	Jan. 13:	18.96,	July 7
1924	22.88,	Feb. 26:	19.21,	Nov. 3
1923	30.86,	Mar. 20:	20.77,	Nov. 20



# Mill Prices of Finished Iron and Steel Products

## Iron and Steel Bars

### Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mill.....	1.85c. to 1.90c.
F.o.b. Chicago.....	2.00c.
Del'd Philadelphia.....	2.17c. to 2.22c.
Del'd New York.....	2.19c. to 2.24c.
Del'd Cleveland.....	2.04c. to 2.09c.
F.o.b. Cleveland.....	1.85c.
F.o.b. Lackawanna.....	1.95c.
F.o.b. Birmingham.....	2.05c. to 2.15c.
C.i.f. Pacific ports.....	2.35c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

### Billet Steel Reinforcing

F.o.b. Pittsburgh mills.....	1.95c. to 2.00c.
F.o.b. Birmingham.....	2.05c. to 2.15c.

### Rail Steel

F.o.b. mills east of Chicago district.....	1.75c.
F.o.b. Chicago Heights mill.....	1.85c.

### Iron

Common iron, f.o.b. Chicago.....	2.00c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.12c.
Common iron, del'd New York.....	2.14c.

## Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.85c. to 1.90c.
F.o.b. Chicago.....	2.00c.
F.o.b. Birmingham.....	2.05c. to 2.15c.
Del'd Cleveland.....	2.04c. to 2.09c.
Del'd Philadelphia.....	2.10c. to 2.15c.
Del'd Coatesville.....	2.00c. to 2.05c.
F.o.b. Sparrows Point.....	2.00c.
F.o.b. Lackawanna.....	1.95c.
Del'd New York.....	2.17½c. to 2.22½c.
C.i.f. Pacific ports.....	2.30c.

## Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.85c. to 1.90c.
F.o.b. Chicago.....	2.00c.
F.o.b. Birmingham.....	2.05c. to 2.15c.
F.o.b. Lackawanna.....	1.95c.
F.o.b. Bethlehem.....	2.00c.
Del'd Cleveland.....	2.04c. to 2.09c.
Del'd Philadelphia.....	2.06c. to 2.18c.
Del'd New York.....	2.14½c. to 2.19½c.
C.i.f. Pacific ports.....	2.35c.

## Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
Narrower than 3 in., P'gh.....	2.20c. to 2.40c.
Wider than 3 in. to 6 in., P'gh.....	1.85c. to 2.10c.
6 in. and wider, P'gh.....	*1.75c. to 1.90c.
Narrower than 3 in., Chicago.....	2.30c. to 2.40c.
From 3 to 6 in., Chicago.....	2.10c. to 2.20c.
6 in. and wider, Chicago.....	2.00c. to 2.10c.
Cotton ties, f.o.b. Atlantic and Gulf ports:	
Carlots per 45-lb. bundle.....	\$1.27
2000 bundle lots.....	1.25
Larger lots.....	1.23

\*Mills follow plate or sheet prices according to gage on wider than 12 in.

## Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills.....	2.20c.
Bars, f.o.b. Chicago.....	2.20c.
Bars, Cleveland.....	2.25c.
Shafting, ground, f.o.b. mill.....	*2.45c. to 2.90c.
Strips, under 12 in., 1 up to 3 tons, P'gh,	3.00c. to 3.15c.
Strips, under 12 in., 1 up to 3 tons, Cleve-	land.....
Strips, under 12 in., 1 up to 3 tons, del'd	Chicago.....
Strips, under 12 in., 1 up to 3 tons, Worces-	ter.....
Fender stock, Pittsburgh.....	4.10c.

\*According to size.

## Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails.....	\$2.55 to \$2.65
Galvanized nails.....	4.55 to 4.65
Galvanized staples.....	3.25 to 3.35
Polished staples.....	3.00 to 3.10
Cement coated nails.....	2.55 to 2.65

### Base Per 100 Lb.

Bright plain wire, No. 9 gage.....	\$2.50
Annealed fence wire.....	2.65
Spring wire.....	3.50
Galv'd wire, No. 9.....	3.10
Barbed wire, galv'd.....	3.35
Barbed wire, painted.....	3.10

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., (wire) mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

## Woven Wire Fence

### Base to Retailers Per Net Ton

F.o.b. Pittsburgh.....	\$65.00
F.o.b. Cleveland.....	65.00
F.o.b. Anderson, Ind.....	66.00
F.o.b. Chicago district mills.....	67.00
F.o.b. Duluth.....	68.00
F.o.b. Birmingham.....	68.00

## Sheets

### Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. P'gh.....	2.00c. to 2.10c.
Nos. 9 and 10, f.o.b. Chicago dist. mill,	2.15c. to 2.25c.
Nos. 9 and 10, del'd Cleveland.....	2.09c. to 2.19c.
Nos. 9 and 10, del'd Philadelphia.....	2.32c. to 2.42c.
Nos. 9 and 10, f.o.b. Birmingham.....	2.20c.

### Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	2.70c. to 2.80c.
No. 24, f.o.b. Chicago dist. mill.....	2.80c. to 2.90c.
No. 24, del'd Cleveland.....	2.79c. to 2.89c.
No. 24, del'd Philadelphia.....	3.02c. to 3.12c.
No. 24, f.o.b. Birmingham.....	3.00c.

### Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade.....	3.90c. to 4.00c.
No. 24, f.o.b. Pittsburgh, B grade.....	3.70c. to 3.80c.

### Galvanized

No. 24, f.o.b. Pittsburgh.....	3.55c. to 3.65c.
No. 24, f.o.b. Chicago dist. mill.....	3.70c. to 3.80c.
No. 24, del'd Cleveland.....	3.64c. to 3.69c.
No. 24, del'd Philadelphia.....	3.87c. to 3.97c.
No. 24, f.o.b. Birmingham.....	3.85c.

### Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	2.90c. to 3.00c.
No. 28, f.o.b. Chicago dist. mill.....	3.10c.

### Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	4.00c.
--------------------------------	--------

### Long Ternes

No. 24, 8-lb. coating, f.o.b. mill primes.....	4.10c.
--	--------

## Tin Plate

### Per Base Box

Standard cokes, f.o.b. P'gh district mills.....	\$5.25
Standard cokes, f.o.b. Gary.....	5.35

## Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating I.C. \$11.20	25-lb. coating I.C. \$16.70
15-lb. coating I.C. 14.00	30-lb. coating I.C. 17.75
20-lb. coating I.C. 15.30	40-lb. coating I.C. 19.85

## Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quality Bar Base, 2.65c.

S.A.E. Series Numbers	Alloy Differential	Net Price 100 Lb. Bars
2000 (¼% Nickel).....	\$0.25	\$2.90
2100 (1¼% Nickel).....	0.55	3.20
2300 (3¼% Nickel).....	1.50	4.15
2500 (5% Nickel).....	2.25	4.90
3100 Nickel Chromium.....	0.55	3.20
3200 Nickel Chromium.....	1.35	4.00
3300 Nickel Chromium.....	3.80	6.45
3400 Nickel Chromium.....	3.20	5.85
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum).....	0.50	3.15
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum).....	0.70	3.35
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel).....	1.05	3.70
5100 Chromium Steel (0.60 to 0.90 Chromium).....	0.35	3.00
5100 Chromium Steel (0.80 to 1.10 Chromium).....	0.45	3.10
5100 Chromium Spring Steel.....	0.20	2.85
6100 Chromium Vanadium Bars.....	1.20	3.85
6100 Chromium Vanadium Spring Steel.....	0.95	3.60
9250 Silicon Manganese Spring Steel.....	0.25	2.90
Chromium Nickel Vanadium.....	1.50	4.15
Carbon Vanadium.....	0.95	3.60

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a \$5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price.

Band sizes are 40c. per 100 lb. higher.

## Rails

### Per Gross Ton

Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	\$6.00
Light (from rail steel), f.o.b. mill.....	\$4.00
Light (from billets), f.o.b. Ch'go mill.....	\$6.00

## Track Equipment

### Base Per 100 Lb.

Spikes, ½ in. and larger.....	\$2.80
Spikes, ½ in. and smaller.....	2.80
Spikes, boat and barge.....	3.00
Tie plates, steel.....	2.15
Angle bars.....	2.75
Track bolts, to steam railroads.....	\$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count.....	70 per cent off list

## Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

### Butt Weld

Steel	Iron
Inches	Black
1 to 3.....	62
3 to 4.....	60
4 to 5.....	58
5 to 6.....	57
6 to 8.....	56
8 to 10.....	54
10 and 12.....	53

### Lap Weld

2.....	55	43½	2.....	23	7
2½ to 6.....	59	47½	2½.....	26	11
7 and 8.....	56	43½	3 to 6.....	28	18
9 and 10.....	54	41½	7 to 12.....	26	11
11 and 12.....	53	40½			

### Butt Weld, extra strong, plain ends

1 to 3.....	41	24½	1 to 3.....	+19	+54
3 to 4.....	47	30½	3 to 4.....	21	17
4 to 5.....	53	42½	4 to 5.....	28	12
5 to 6.....	58	47½	5 to 6.....	30	14
6 to 8.....	60	49½			
8 to 10.....	61	50½			

### Lap Weld, extra strong, plain ends

2.....	53	42½	2.....	23	9
2½ to 4.....	57	46½	2½.....	29	15
4½ to 6.....	56	46½	4½ to 6.....	28	14
7 to 8.....	52	39½	7 to 8.....	21	7
9 and 10.....	45	32½	9 to 12.....	16	2
11 and 12.....	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

## Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel	Charcoal Iron
2 to 2½ in.....	27
2½ to 3 in.....	37
3 in.....	40
3½ to 4 in.....	42½
4 to 4½ in.....	46
4½ to 5 in.....	48
5 to 5½ in.....	50
5½ to 6 in.....	52
6 to 6½ in.....	54
6½ to 7 in.....	56
7 to 7½ in.....	58
7½ to 8 in.....	60
8 to 8½ in.....	62
8½ to 9 in.....	64
9 to 9½ in.....	66
9½ to 10 in.....	68
10 to 10½ in.....	70
10½ to 11 in.....	72
11 to 11½ in.....	74
11½ to 12 in.....	76
12 to 12½ in.....	78
12½ to 13 in.....	80
13 to 13½ in.....	82
13½ to 14 in.....	84
14 to 14½ in.....	86
14½ to 15 in.....	88
15 to 15½ in.....	90
15½ to 16 in.....	92
16 to 16½ in.....	94
16½ to 17 in.....	96
17 to 17½ in.....	98
17½ to 18 in.....	100

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

## Standard Commercial Seamless Boiler Tubes

### Tubes

### Cold Drawn

1 in.....	60	3 in.....	45
1½ to 1¾ in.....	52	3½ to 3¾ in.....	47
1¾ in.....	36	4 in.....	50
2 to 2½ in.....	31	4½, 5 and 6 in.....	45
2½ to 3 in.....	39		

### Hot Rolled

2 and 2½ in.....	37	3½ and 3¾ in.....	53
2½ and 3 in.....	45	4 in.....	56
3 in.....	51	4½, 5 and 6 in.....	51

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

## Seamless Mechanical Tubing

### Per Cent Off List

Carbon, 0.10% to 0.30%, base.....	55
Carbon, 0.30% to 0.40%, base.....	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.



numerous, but are usually for small lots. The volume is not as large as it was a month ago. Some pressure is being exerted against prices, but does not appear to have brought about any marked weakening.

**Hot-Rolled Flats.**—Very narrow strips and hoops and bands hold well at 2.20c., base, and the market is fairly steady on strips from 3 in. to 6 in. in width. In wider material, prices show irregularity, owing to competition from sheets and plates. Specifications generally are well up to the April rate, and with some companies they are exceeding those of a month ago by as much as 10 per cent. Strictly new business is moderate.

**Cold-Rolled Strips.**—New business is light, but buyers are taking shipments freely on old orders. Prices are steady, but the absence of large new business precludes a real test.

**Bolts, Nuts and Rivets.**—Some makers having a considerable share of railroad business are doing well, but the industry as a whole averages at least 10 per cent less active this month than last month. Prices are steady.

**Coke and Coal.**—No material change in general market conditions is noted. The demand for spot tonnages of both furnace and foundry coke is limited and the principal outlet for furnace grade is still to water gas plants. Foundries are getting ample supplies in shipments against contracts. Some tendency is noted to scale down coke production in preparation for a larger demand for coal. The Baltimore & Ohio Railroad has not followed the Pennsylvania and New York Central in reducing rates on coal for the Lake trade, and as a number of industrial consumers along the Lake front will not benefit from the reduction, which is to apply only on Northwestern shipments, there is some doubt that the Interstate Commerce Commission will approve it. However, if it does it would sustain a former decision establishing a differential of 45c. per ton between rates from Southern and Northern mines. The matter is before the commission and a decision is yet to be made. Meanwhile, there is not much Lake business, and demands from other directions are light. If much Lake business develops, it probably would mean a firmer coke market, since the coal prices, which are expected to run from \$1.65 to \$1.75, at mines, would be much more profitable than coke at its present prices.

**Old Material.**—A recession in consuming demand and smaller interest in the market by dealers have weakened the steel works grades, heavy melting steel being down 50c. a ton from its range of a week ago. Dealers are picking up tonnage for one or two points at as low as \$14.50 and the market is quotable up to \$15.50 for strictly No. 1 railroad steel. Prices have receded rather sharply on steel foundry grades, demand for which is extremely limited on account of a low rate of operations of such foundries. Blast furnace scrap

also has given ground, as have also machine shop turnings.

*Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:*

Basic Open-Hearth Furnace Grades:	
Heavy melting steel.....	\$14.50 to \$15.50
Scrap rails.....	15.00 to 15.50
Compressed sheet steel.....	14.75 to 15.00
Bundled sheets, sides and ends...	13.75 to 14.00
Cast iron carwheels.....	14.50 to 15.00
Sheet bar crops, ordinary.....	15.50 to 16.00
Heavy breakable cast.....	12.50 to 13.00
No. 2 railroad wrought.....	15.00 to 15.50
Heavy steel axle turnings.....	13.00 to 13.50
Machine shop turnings.....	10.00 to 10.50
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers...	16.00 to 16.50
Railroad coil and leaf springs....	16.00 to 16.50
Rolled steel wheels.....	16.00 to 16.50
Low phosphorus billet and bloom ends .....	18.50 to 19.00
Low phosphorus, mill plate.....	17.50 to 18.00
Low phosphorus, light grade.....	16.50 to 17.00
Low phosphorus sheet bar crops....	17.50 to 18.00
Heavy steel axle turnings.....	13.00 to 13.50
Electric Furnace Grades:	
Low phosphorus punchings.....	16.50 to 17.00
Heavy steel axle turnings.....	13.00 to 13.50
Blast Furnace Grades:	
Short shoveling steel turnings...	10.75 to 11.00
Short mixed borings and turnings ..	10.75 to 11.00
Cast iron borings.....	10.75 to 11.00
No. 2 bushelings.....	10.00 to 10.50
Rolling Mill Grades:	
Steel car axles.....	18.00 to 19.00
No. 1 railroad wrought.....	11.00 to 12.00
Sheet bar crops.....	17.00 to 17.50
Cupola Grades:	
No. 1 cast.....	14.50 to 15.00
Rails 3 ft. and under.....	16.00 to 16.50
Malleable Grades:	
Railroad .....	15.00 to 15.50
Industrial .....	14.50 to 15.00
Agricultural .....	14.00 to 14.50

## New Vanadium-Titanium Pig Iron

A vanadium-titanium pig iron made in Norway from ore containing the vanadium and titanium has been put on the market in this country by Rogers Brown & Crocker Brothers, New York, who have been appointed exclusive agents in the United States and Canada. The iron is made in electric furnaces, using Norwegian charcoal as a reducing agent. Production is by the Br manger Kraftselskap (Bremanger Power Co.), Bergen, and the Christiania Spikerverk (Christiania Nail Works), Oslo, associated companies. The latter has an annual capacity of 2000 tons, and the former, after July 1, will be able to make 20,000 tons a year.

The standard analysis of the pig iron is as follows: Carbon, about 4 per cent; phosphorus, 0.025 per cent maximum; sulphur, a maximum of 0.025 per cent; silicon, 0.5 to 2.0 per cent, as desired; manganese, a maximum of 0.2 per cent; vanadium, a minimum of 0.5 per cent; titanium, about 0.5 per cent. The sulphur content can be reduced to 0.015 per cent, if stipulated.

Ordinarily vanadium acts as a "scavenger" and only a fraction is left in the metal for alloying effect, but in this instance, it is said, the titanium acts as the scavenger and the vanadium content is left virtually intact. At the same time the loss in titanium is only 20 per cent, it is stated. The titanium is also recommended for its graphitizing effect, acting in the same manner as silicon, only in a greater degree.

The iron is said to be particularly effective, when added to the cupola mixture, in making cylinders and other castings exposed to wear. It is also recommended for the manufacture of tool steels and other alloy steels, particularly by the crucible process. Good results are said to accrue from use of the iron in making malleable iron and electric steel castings. The pig iron is offered at \$40 per ton, duty paid, Atlantic ports.

The Fort Worth Structural Steel Co. has been established at Fort Worth, Tex. It has taken over by lease the structural steel and tank department of the Fort Worth Steel & Machinery Co., but there is no financial connection between the two companies. J. H. Brillhart is president and general manager, C. H. Brillhart, vice-president, C. A. Fischer, treasurer and G. A. Brightwell, secretary.

## Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates .....	3.00c.
Structural shapes .....	3.00c.
Soft steel bars and small shapes.....	2.90c.
Reinforcing steel bars.....	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons.....	3.60c.
Squares and flats.....	4.10c.
Bands .....	3.60c.
Hoops .....	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles .....	3.65c.
Galvanized sheets (No. 24 gage), 25 or more bundles .....	4.50c.
Blue annealed sheets (No. 10 gage), 25 or more sheets .....	3.10c.
Galvanized corrugated sheets (No. 28 gage), per square.....	\$4.39
Spikes, large .....	3.40c.
Small .....	3.80c. to 5.25c.
Roat .....	3.80c.
Track bolts, all sizes, per 100 count, 60 per cent off list .....	
Machine bolts, per 100 count, .60 per cent off list .....	
Carriage bolts, per 100 count, .60 per cent off list .....	
Nuts, all styles, per 100 count, .60 per cent off list .....	
Large rivets, base per 100 lb.....	\$3.50
Wire, black soft annealed, base per 100 lb.....	\$3.00 to 3.10
Wire, galvanized soft, base per 100 lb.....	3.00 to 3.10
Common wire nails, per keg.....	3.00
Cement coated nails, per keg.....	3.05

# Semi-Finished Steel, Raw Materials, Bolts and Rivets

## Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

### Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over.....	\$33.00
Rerolling, under 4-in. to and including 1½-in. ....	\$33.50 to 34.00
Forging, ordinary .....	38.00
Forging, guaranteed .....	43.00

### Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer.....	\$34.00

### Slabs

	Per Gross Ton
8 in. x 2 in. and larger.....	\$33.00
Smaller than 8 in. x 2 in. ....	34.00

### Skelp

	Per Lb.
Grooved .....	1.85c. to 1.90c.
Sheared .....	1.85c. to 1.90c.
Universal .....	1.85c. to 1.90c.

### Wire Rods

	Per Gross Ton
*Common soft, base.....	\$42.00 to \$44.00
Screw stock .....	\$5.00 per ton over base

\*Chicago mill base is \$45. Cleveland mill base, \$44.

## Prices of Raw Material

### Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron.....	\$4.55
Old range non-Bessemer, 51.50% iron.....	4.40
Mesabi Bessemer, 51.50% iron.....	4.40
Mesabi non-Bessemer, 51.50% iron.....	4.25
High phosphorus, 51.50% iron.....	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria.....	10.00c.
Iron ore, Swedish, average 66% iron, concentrates .....	9.25c. to 9.50c.

Manganese ore, washed, 52% manganese, from the Caucasus.....

	Per Gross Ton
Manganese ore, Brazilian, African or Indian, basis 50% .....	38c. to 39c.
Tungsten ore, high grade, per unit, in 60% concentrates .....	\$10.50 to \$10.75

Chrome ore, 45 to 50% Cr<sub>2</sub>O<sub>3</sub>, crude, c.i.f. Atlantic seaboard .....

	Per Lb.
Molybdenum ore, 85% concentrates of MoS <sub>2</sub> , delivered .....	50c. to 55c.

### Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt .....	\$2.60 to \$2.75
Foundry, f.o.b. Connellsville prompt .....	3.50 to 4.25
Foundry, by-product, Ch'go ovens.....	9.00
Foundry, by-product, New England, del'd .....	11.00
Foundry, by-product, Newark or Jersey City, delivered.....	9.00 to 9.40
Foundry, Birmingham .....	5.00
Foundry, by-product, St. Louis.....	9.75

### Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines .....	\$1.40 to \$1.80
Mine run coking coal, f.o.b. W. Pa. mines .....	1.50 to 1.75
Gas coal, ¾-in., f.o.b. Pa. mines.....	2.00 to 2.10
Mine run gas coal, f.o.b. Pa. mines.....	1.75 to 1.90
Steam slack, f.o.b. W. Pa. mines.....	1.05 to 1.10
Gas slack, f.o.b. W. Pa. mines.....	1.10 to 1.25

### Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd.....	\$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid .....	105.00

### Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21% .....	\$31.00 to \$32.00
Domestic, 16 to 19% .....	29.00

### Electric Ferrosilicon

	Per Gross Ton Delivered
50% .....	\$83.50 to \$88.50
75% .....	130.00 to 140.00

	Per Gross Ton Furnace
10% .....	\$35.00
11% .....	37.00
12% .....	\$39.00
14 to 16% .....	45.00

### Bessemer Ferrosilicon

	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace .....	32.00
10% .....	\$30.00
11% .....	32.00
12% .....	\$34.00

### Silvery Iron

	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace .....	26.00
6% .....	\$23.00
7% .....	24.00
8% .....	25.00
9% .....	26.00
10% .....	\$28.00
11% .....	30.00
12% .....	32.00

### Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd .....	92c. to 95c.
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads.....	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace .....	\$3.15 to \$3.65
Ferrocobalt, 15 to 18%, per net ton, f.o.b. furnace, in carloads.....	\$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton.....	\$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton.....	\$122.50

### Fluxes and Refractories

#### Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines.....	\$16.00
No. 2 lump, Illinois and Kentucky mines.....	\$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid.....	\$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2¼% silica, f.o.b. Illinois and Kentucky mines.....	\$32.50

#### Fire Clay

	Per 1000 f.o.b. Works
First Quality .....	Second Quality
Pennsylvania .....	\$43.00 to \$46.00 \$35.00 to \$38.00
Maryland .....	43.00 to 46.90 35.00 to 38.00
New Jersey .....	50.00 to 65.00
Ohio .....	43.00 to 46.00 35.00 to 38.00
Kentucky .....	43.00 to 46.00 35.00 to 38.00
Missouri .....	43.00 to 46.00 35.00 to 38.00
Illinois .....	43.00 to 46.00 35.00 to 38.00
Ground fire clay, per ton .....	7.00

#### Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania .....	\$43.00
Chicago .....	52.00
Birmingham .....	50.00
Silica clay, per ton.....	\$8.50 to 10.00

#### Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.....	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.....	40.00

#### Chrome Brick

	Per Net Ton
Standard size .....	\$45.00

## Mill Prices of Bolts, Nuts, Rivets and Set Screws

### Bolts and Nuts

Per 100 Pieces (F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts .....	.70
†Carriage bolts .....	.70
Lag bolts .....	.70
Plow bolts, Nos. 1, 2, 3 and 7 heads.....	.70
Hot-pressed nuts, blank or tapped, square.....	.70
Hot-pressed nuts, blank or tapped, hexagons ..	.70
C.p.c. and t. square or hex. nuts, blank or tapped .....	.70
Washers* .....	6.75c. to 6.50c. per lb. off list

\*F.o.b. Chicago, New York and Pittsburgh. †Bolts with rolled thread up to and including ¾ in. x 6 in. take 10 per cent lower list prices.

### Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts.....	.70
Semi-finished hexagon castellated nuts, S.A.E. .70	
Stove bolts in packages, Pittsburgh.....	.80, 10 and 2½
Stove bolts in packages, Chicago.....	.75, 20, 10 and 5
Stove bolts in bulk, Pittsburgh.....	.80, 10 and 5
Stove bolts in bulk, Chicago.....	.75, 20, 10, 5 and 2½
Tire bolts .....	.60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

### Large Rivets

	Base per 100 Lb.
(½-In. and Larger)	
F.o.b. Pittsburgh or Cleveland.....	\$2.90
F.o.b. Chicago .....	3.00

### Small Rivets

(¾-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh.....	.70 and 10 to 70
F.o.b. Cleveland.....	.70 and 10 to 70
F.o.b. Chicago .....	.70 and 10 to 70

### Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws.....	.80, 10 and 10
Milled standard set screws, case hardened.....	.80 and 10
Milled headless set screws, cut thread.....	.80
Upset hex. head cap screws, U.S.S. thread.....	.85 and 5
Upset hex. cap screws, S.A.E. thread.....	.85 and 5
Upset set screws.....	.80, 10 and 10
Milled studs.....	.70 and 5

# Chicago

## Steel Demand Tapering Gradually — 30,000 Tons of Pig Iron for Third Quarter on Inquiry

CHICAGO, May 22.—The Chicago district steel market, though giving definite signs of tapering to summer output and demand, is nevertheless undergoing this change gradually and at a much slower pace than has been the experience of mills in recent years.

The leading producer, having made a week ago a switch in furnaces at South Chicago and at Gary, has actually increased pig iron output for the reason that the blast furnace added at Gary is of larger capacity than the one put out at South Works. Ingot production, while now a shade below 95 per cent of capacity, is holding remarkably steady in view of the fact that rail mill schedules are expected momentarily to taper.

The possibility of a sustained demand for structural shapes is indicated by unusual activity on the part of architects and the well scattered and large aggregate tonnage that is actually on inquiry. The site is being cleared for the Mercantile Mart, and it now seems probable that the 50,000 tons or more of steel that will be required may be purchased by the middle of June. The development of air rights over the Randolph Street terminal of the Illinois Central is being considered.

Water shipments of steel to Chicago are assuming larger proportions and give promise of being a definite factor in this market during the open season of navigation.

The price situation remains unchanged except for a more clearly defined weakness in wire nails. In heavy tonnage products, quotations on narrow plates show the least stability.

**Pig Iron.**—This week has marked the arrival at Chicago of about 2000 tons of English hematite iron for delivery to a Milwaukee melter. A cargo of Northern iron has arrived at Milwaukee from a Lake Erie port. The trade is anxiously watching the effect of the new \$18 price at Chicago on the movement of iron from Lake furnaces by boat. Several cargoes are under contract and are expected to arrive here early in June. Shipments from local furnaces are steady, but sales are confined to spot business, which in the aggregate is not heavy. On the other hand, the outlook is favorable because not less than 30,000 tons for third quarter and last half delivery is being openly asked for. One user will take 5000 tons of malleable iron. Like tonnages of Northern foundry iron are being sought by two other foundries. Miscellaneous lots of charcoal iron are moving at the full prices. Several small inquiries are out for low phosphorus iron.

### Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	\$18.00
N't'n No. 1 fdy., sil. 2.25 to 2.75	18.50
Malleable, not over 2.25 sil.	18.00
High phosphorus	18.00
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	21.51
Southern No. 2 (barge and rail)	20.68
Low phos., sil. 1 to 2 per cent, copper free	\$28.50 to 29.00
Silvery, sil. 8 per cent.	29.79
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

**Ferroalloys.**—The advance of \$5 a ton on ferromanganese has not brought out business, as had been expected by some. It is clearly indicated that many users will exercise first half contracts to lay in a supply which will carry well into the second half. Several inquiries for 200 to 300 tons each of spiegeleisen are before the trade.

Prices delivered Chicago: 80 per cent ferromanganese, \$112.56; 50 per cent ferrosilicon, \$83.50 to \$87.50; spiegeleisen, 19 to 21 per cent, \$37.76 to \$39.76.

**Plates.**—It is reported that a Western producer has obtained the contract for pipe for a gas line that will extend from the Southwest into Kansas City, but financial arrangements have not been completed and the

100,000 tons of plates required has not been inquired for. Two orders for tank plates totaling 2500 tons have been placed by two Texas oil producers. Inquiry is small, but steel producers are led to believe that additional business will come out soon. Chicago district plate mills are engaged at not far from capacity in practically all sizes up to the extreme widths. In some quarters it is believed that new railroad business is developing. Some car inquiry, it is said, is waiting only on official sanction. In the meantime, however, Western car builders continue to reduce their order books and it is not improbable that curtailment of shop operations will be necessary before new business gets under way, even if orders are placed in the next few weeks. Specifications to mills from car builders are in fair volume, and there still remains a moderate amount of steel to be ordered against car contracts that have been taken in recent weeks. Prices for plates in the immediate Chicago territory are moderately steady at 2c., Chicago, the greatest unevenness appearing on scattered sales in narrow widths.

Mill prices on plates per lb.: 2.00c., base Chicago.

**Structural Material.**—Miscellaneous structural awards in the week total about 5500 tons. Individual orders are not large. Going business is much to the liking of some fabricators, who are in need of small work to fill in shop schedules for economical operation. The American Bridge Co. has taken 950 tons for a building for the Crane Co., Chicago, and the Wisconsin Bridge Co., Milwaukee, has been awarded 600 tons for a school at Fond Du Lac, Wis. Previous bids on the Austin High School, Chicago, which requires close to 3500 tons, were thrown out, and it was disclosed in opening the new bids that the Great Lakes Construction Co., Chicago, is low. Bids on the restoration of the Fine Arts Building, Jackson Park, Chicago, have overrun estimates by \$500,000. The South Park Commissioners have not made public the course that will now be taken. Prominent among new inquiries are 1600 tons for an office building in Chicago, a like tonnage for a theater in San Antonio, Tex., and 800 tons for the Delco-Remy Corporation, Anderson, Ind. Prices for structural material remain unchanged at 2c., Chicago, except where producers are influenced to make lower quotations on specific projects.

Mill prices on plain material per lb.: 2.00c., base, Chicago.

**Rails and Track Supplies.**—A Western railroad has ordered 4000 tons of standard-section rails for delivery in the early summer months. Inquiry is small. Miscellaneous orders for track supplies total 3000 tons, and only a small amount of business is before the trade. A few carlot orders for light rails have been placed. Although the aggregate tonnage is not large, it is the heaviest for any like period in several months. Rail mills are operating at close to 90 per cent of capacity this week, but shipping instructions and order books are such that output will begin to taper at an early date. Track accessory departments are busy and changes in tonnage produced will lag a measurable time behind the cut in rail mill output. The iron tie plate market is quiet.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, \$43; light rails, rolled from billets, \$36. Per lb.: Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.25c.; angle bars, 2.75c.

**Cast Iron Pipe.**—The only new order of note this week was placed by St. Clair Shores, Mich. This business, which went to the National Cast Iron Pipe Co., called for 19 miles of 6 and 8-in. centrifugal pipe. Contractors in the immediate Chicago territory are busy, but on pipe that was ordered some time ago and which has been on the ground awaiting favorable weather. New orders from that source are close to the low point in two years and this situation is causing some concern to pipe sellers, who sense a condition wherein it is not improbable that subdivision and suburban work, having been rushed for many months, is now actually ahead of demand. It is believed that pipe laying programs will be curtailed for some time to come, that is until the growth in population more than makes use of the pipe that is already in the ground. Orders by the railroads are small and little new tonnage is coming from public utilities, which in many instances have already placed contracts for the pipe needed in their



spring and summer programs. With pipe foundries working on an average of a single 8-hr. turn, deliveries are about 30 days in most sizes. Foundry stocks of cast iron pipe are reported as not being overly large for this time of the year. Prices for going tonnages are steady at \$31 to \$33, Birmingham, for 6-in. and larger diameters.

*Prices per net ton, delivered Chicago:* Water pipe, 6-in. and over, \$38.20 to \$41.20; 4-in., \$42.20 to \$45.20; Class A and gas pipe, \$4 extra.

**Sheets.**—Lack of orders has forced Chicago hot mills to cut operations to 50 per cent of capacity. Summer weather, of which several days already have been experienced, is now close at hand and will have its usual bearing on the willingness and ability of labor to produce sheet products. In some respects sellers are reconciled to small orders at this time of the year, for they point to the fact that the period from May 15 to June 15 or a little later is normally a low point in purchases of sheets in this territory. Sheets are moving out of warehouse in fair tonnage, but stocks have been well built up, and the result is that few orders come from that source to producers. The roofing trade is quiet because of the lack of interest in districts where farmers are busily engaged in the fields. A fair tonnage is still coming from the Northwest, where the season has been backward. Prices, unchanged from a week ago, lack strength.

*Base prices per lb., delivered from mill in Chicago:* No. 24 black, 2.85c. to 2.95c.; No. 24 galvanized, 3.75c. to 3.85c.; No. 10 blue annealed, 2.20c. to 2.30c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

**Bars.**—Specifications and also new sales in soft steel bars are on a parity with shipments, as miscellaneous buyers in an ever widening circle continue to find use for large tonnages of this commodity. Judged by orders to Chicago mills, there is little or no change in demand from the automobile trade, although adjustments up or down are going on at individual plants. Ford's requirements have already gone beyond the capacity of his own steel mills and many of his parts makers are free to buy steel in the open market. Alloy steel bars are being shipped at mill capacity, and prices are steady. Backlogs in iron bars are the best in months, but after a short run of heavier specifications there is a lessened demand for shipments. Both specifications and new purchases in rail steel bars have climbed well above the rate of output and Chicago Heights mills have completed a two and a half year period without an interruption in double turn operation. Fence post shipments are heavier. Producers will announce fall terms on this commodity before June 1. Hard steel bars are steady at 1.85c., local mills.

*Mill prices per lb.:* Soft steel bars, 2.00c., base, Chicago; common bar iron, 2.00c., base, Chicago; rail steel bars, 1.85c., base, Chicago Heights mill.

**Coke.**—Chicago district users of by-product foundry coke are expecting a steady demand. Ovens are all lighted. Prices are firm at \$9, f.o.b. local ovens, and \$9.50, delivered in the Chicago switching district.

**Bolts, Nuts and Rivets.**—Specifications for these commodities are measurably lower, though release orders on makers' books are of such size that output re-

mains close to 65 per cent of capacity. Prices for rivets are steady.

**Reinforcing Bars.**—New business in reinforcing bars is confined almost wholly to a great number of small tonnage sales and inquiries. Heavy tonnage projects are moving slowly, though many of them seem assured. New price schedules are holding. Warehouses are quoting 2.30c. to 3c. on billet stock bars and 2c. to 2.70c. for the rail steel commodity. Warehouse extras are the same for both hard and soft steel bars, being \$3 a net ton for trucking, \$8 for beam and slab bending, \$20 for stirrup and column tie bending and \$5 for engineering service. Many small orders are largely responsible for a higher rate of bending shop operations. Books are small, however, and output can be sustained only by a steady flow of new business.

**Wire Products.**—Little change is noted in this market. Nail business is dull. Sellers are quoting prices on small lots from \$2.55 to \$2.60, base per keg, Chicago. The overstocked condition of many jobbers is still an unsettling factor throughout this territory. In the larger centers, prices for manufacturers' wire are holding firmly at \$2.55, Chicago, but this price has been shaded at St. Paul. On the whole, the volume of business being booked is good for this time of the year and production is at an undiminished rate. Prices for wire and wire products are given on page 1493.

**Old Material.**—A Chicago steel mill has arranged to take direct from a Milwaukee producer not less than 35,000 tons of heavy melting steel. Purchasers of specialties are insistent on deliveries on old orders, but they are not interested in new purchases. Prices have changed little since a week ago. Some dealers feel that the market has strengthened because certain signs point to a shortage of scrap. However, buyers are taking the opposite viewpoint and are insisting upon, and in most instances are getting, the grades sought. The Rock Island has sold 5000 tons of scrap and the Chicago & Alton will dispose of 1000 tons.

*Prices delivered consumers' yards, Chicago:*

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel.....	\$13.00 to \$13.50
Shoveling steel.....	13.00 to 13.50
Frogs, switches and guards, cut apart, and miscellaneous rails.....	13.50 to 14.00
Hydraulic compressed sheets.....	11.25 to 11.75
Drop forge flashings.....	9.50 to 10.00
Forged, cast and rolled steel car wheels.....	15.50 to 16.00
Railroad tires, charging box size.....	16.75 to 17.25
Railroad leaf springs, cut apart.....	16.75 to 17.25
Acid Open-Hearth Grades:	
Steel couplers and knuckles.....	14.50 to 15.00
Coil springs.....	17.00 to 17.50
Electric Furnace Grades:	
Axle turnings.....	13.00 to 13.50
Low phosphorus punchings.....	14.25 to 14.75
Low phosphorus plate, 12 in. and under.....	14.25 to 14.75
Blast Furnace Grades:	
Axle turnings.....	10.00 to 10.50
Cast iron borings.....	9.25 to 9.75
Short shoveling turnings.....	9.25 to 9.75
Machine shop turnings.....	6.75 to 7.25
Rolling Mill Grades:	
Iron rails.....	14.00 to 14.50
Rerolling rails.....	14.50 to 15.00
Cupola Grades:	
Steel rails less than 3 ft.....	15.25 to 15.75
Angle bars, steel.....	14.50 to 15.00
Cast iron car wheels.....	13.50 to 14.00
Malleable Grades:	
Railroad.....	13.00 to 13.50
Agricultural.....	12.00 to 12.50
Miscellaneous:	
*Relaying rails, 56 to 60 lb.....	23.00 to 25.00
*Relaying rails, 65 lb. and heavier.....	26.00 to 31.00

*Per Net Ton*

Rolling Mill Grades:	
Iron angles and splice bars.....	14.25 to 14.75
Iron arch bars and transoms.....	19.50 to 20.00
Iron car axles.....	23.00 to 23.50
Steel car axles.....	16.00 to 16.50
No. 1 railroad wrought.....	11.75 to 12.25
No. 2 railroad wrought.....	11.50 to 12.00
No. 1 busheling.....	10.00 to 10.50
No. 2 busheling.....	5.75 to 6.25
Locomotive tires smooth.....	12.50 to 13.00
Pipes and flues.....	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast.....	14.00 to 14.50
No. 1 railroad cast.....	12.75 to 13.25
No. 1 agricultural cast.....	12.50 to 13.00
Stove plate.....	11.25 to 11.75
Grate bars.....	11.25 to 11.75
Brake shoes.....	11.00 to 11.50

\*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

#### Warehouse Prices, f.o.b. Chicago

Base per Lb.	
Plates and structural shapes.....	3.10c.
Soft steel bars.....	3.00c.
Reinforcing bars, billet steel.....	2.30c. to 3.00c.
Reinforcing bars, hard steel.....	2.00c. to 2.70c.
Cold-finished steel bars and shafting—	
Rounds and hexagons.....	3.60c.
Flats and squares.....	4.10c.
Bands.....	3.65c.
Hoops.....	4.15c.
Black sheets (No. 24).....	3.95c.
Galvanized sheets (No. 24).....	4.80c.
Blue annealed sheets (No. 10).....	3.50c.
Spikes, standard railroad.....	3.55c.
Track bolts.....	4.55c.
Rivets, structural.....	3.60c.
Rivets, boiler.....	3.60c.
Per Cent Off List	
Machine bolts.....	60
Carriage bolts.....	60
Coach or lag screws.....	60
Hot-pressed nuts, squares, tapped or blank.....	60
Hot-pressed nuts, hexagons, tapped or blank.....	60
No. 8 black annealed wire, per 100 lb.....	\$3.30
Common wire nails, base per keg.....	3.10
Cement coated nails, base per keg.....	3.10

# Philadelphia

## Shipments of Steel Fairly Good, but New Orders Are Restricted

PHILADELPHIA, May 22.—A good volume of steel tonnage is being shipped to consumers on second quarter contracts, but new business is decidedly small. As prices show no tendency to advance, hand-to-mouth buying has again set in. Mills are maintaining a fair rate of operation, but current bookings are apparently of insufficient size to assure continuation of the present production schedules. Prices of plates and bars are not strong, but 2c. per lb., Coatesville, on plates and 1.85c., Pittsburgh, on bars are apparently the minimum as well as maximum quotations to consumers in this district. Shape prices show more irregularity than those on other products, and the tendency of fabricated steel prices is still downward.

Automobile body builders, especially manufacturers of commercial bodies, are active consumers of sheets, but the market generally continues unsteady. Eastern Pennsylvania producers of blue annealed sheets are still endeavoring to maintain 2.10c., Pittsburgh, despite a growing volume of sales at 2c. Concessions of \$1 a ton from 2.70c., Pittsburgh, on black sheets are appearing on desirable business. The minimum price on galvanized sheets is apparently 3.60c. per lb., Pittsburgh, and this is seldom exceeded, except on less than carload lots.

**Ferromanganese.**—Consumers are beginning to inquire for small tonnages for third quarter and second half, but contracting is not expected for another week or two. Both domestic producers and importers of ferromanganese are quoting \$105 per ton, seaboard.

**Billets.**—No large buying is reported. Prices are unchanged at \$33 per ton for rerolling billets and \$38 per ton, Pittsburgh, for forging quality.

**Bars.**—Except on orders for less than carloads, 1.90c., Pittsburgh, or 2.22c., delivered Philadelphia, has disappeared, and 1.85c., Pittsburgh, or 2.17c., Philadelphia, applies.

**Pig Iron.**—An increase in the number of foundry iron inquiries is reported, with buyers showing some interest in third quarter requirements. Furnaces are maintaining prices on foundry grade at \$20, furnace, which is apparently firm on the small volume of current business. Foundries are operating at a fair rate, and are consuming most of the iron shipped to them on second quarter contracts and have only small stocks of iron on their yards. There is very little inquiry for low phosphorus iron and sales are limited to occasional carloads. Buffalo foundry iron, sold prior to the opening of canal navigation for delivery by water and rail to eastern Pennsylvania consumers, is beginning to arrive, but no new business of consequence is reported for this de-

livery. Virginia iron prices are unchanged at \$20 to \$20.50 per ton, furnace, but Virginia cast iron pipe producers are expected to be in the market within the next week to 10 days for 10,000 tons or more of foundry iron, and with Birmingham furnaces quoting \$15.50 to \$16 per ton, furnace, a reduction by the Virginia interest is expected.

### Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$20.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26
East. Pa. No. 1X.	21.76
Basic (delivered eastern Pa.)	\$19.00 to 19.50
Gray forge	19.75 to 20.25
Malleable	21.00 to 21.50
Standard low phos. (f.o.b. New York State furnace)	22.00 to 23.00
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	24.54 to 25.04
Virginia No. 2X, 2.25 to 2.75 sil.	25.04 to 25.54

Prices, except as specified otherwise, are delivered Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$4.54 from Virginia furnaces.

**Shapes.**—Based on current quotations of 2c. per lb., Pencoyd, and 2c. per lb., Bethlehem, delivered prices are quotable at 2.06c. to 2.13c. per lb., Philadelphia. While 2.06c., delivered Philadelphia, has been shaded occasionally, such concessions have apparently been granted only on large orders. Current fabricated steel projects are small, and prices show continued weakness. The Phoenix Iron Co. has recently increased its range of sizes to include 6-in. H-beams. Two bridges in Philadelphia will require about 250 tons of steel and an apartment building at Rittenhouse Square calls for 2000 tons.

**Old Material.**—Prices show a slight tendency toward recession on certain grades of scrap, as reflected by recent purchases. No. 1 blast furnace scrap has been bought at \$10.50 per ton, delivered Steelton, Pa., the amount totaling about 2000 tons. A consumer at Phoenixville has paid \$11.75 for a fair tonnage of stove plate, and a Harrisburg user of stove plate has bought at \$11.50 per ton. No contracts for machine shop turnings are reported, but \$10.50 to \$10.75 per ton is being paid on current shipments of carload lots to eastern Pennsylvania consumers.

### Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	\$13.50 to \$14.00
Scrap T rails	13.00 to 13.50
No. 2 heavy melting steel	11.00 to 11.50
No. 1 railroad wrought	14.50 to 15.00
Bundled sheets (for steel works)	10.50
Machine shop turnings (for steel works)	10.50 to 10.75
Heavy axle turnings (or equivalent)	12.00 to 12.50
Cast borings (for steel works and rolling mill)	10.50
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	11.50 to 12.00
Stove plate (for steel works)	11.50 to 11.75
No. 1 low phos., heavy, 0.04 per cent and under	17.50 to 18.00
Couplers and knuckles	15.50 to 16.00
Rolled steel wheels	15.50 to 16.00
No. 1 blast furnace scrap	10.50
Machine shop turnings (for rolling mill)	11.00 to 11.25
Wrought iron and soft steel pipes and tubes (new specifications)	12.00 to 12.50
Shafting	17.50 to 18.00
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00 to 11.50
Steel rails for rolling	14.75 to 15.25
Cast iron carwheels	15.50 to 16.00
No. 1 cast	16.00 to 16.50
Cast borings (for chemical plant)	14.50 to 15.00

**Plates.**—The market is fairly firm at 2c. per lb., Coatesville, or 2.10c. per lb., delivered Philadelphia. This price applies even on small tonnages, which represent practically all of current purchases by plate consumers. Mills are still maintaining a fair rate of operation, but new business is small, so that unless there is a good volume of contracting for third quarter some curtailment of present production seems likely. Oil company consumption of plates is reported fairly good. The Baldwin Locomotive Works has received an order from the Erie Railroad for 35 locomotives.

**Sheets.**—Eastern Pennsylvania producers of blue annealed sheets are still endeavoring to maintain 2.10c. per lb., Pittsburgh, or 2.42c. per lb., delivered Philadelphia. This price still applies on less than carload lots, but 2c. and 2.05c. per lb., Pittsburgh, are commonly quoted on the more desirable tonnages. Black

### Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, 1/4-in. and heavier	2.50c. to 2.60c.
Plates, 5/16-in.	2.80c. to 3.00c.
Structural shapes	2.40c. to 2.60c.
Soft steel bars, small shapes and iron bars (except bands)	2.50c.
Round-edge iron	3.50c.
Round-edge steel, iron finished	3.50c.
1 1/2 x 1 1/2 in.	4.30c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	2.50c. to 3.00c.
Cold-finished steel, rounds and hexagons	3.35c.
Cold-finished steel, squares and flats	3.85c.
Steel hoops	3.50c.
Steel bands, No. 12 gage to 5/16-in., inclusive	3.25c.
Spring steel	5.00c.
*Black sheets (No. 24)	4.00c.
*Galvanized sheets (No. 24)	4.75c.
Blue annealed sheets (No. 10)	3.15c.
Diamond pattern floor plates—	
1/4-in.	5.30c.
5/16-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

\*For 50 bundles or more; 10 to 49 bundles, 4.25c. base; 1 to 9 bundles, 4.50c. base.

†For 50 bundles or more; 10 to 49 bundles, 5.10c. base; 1 to 9 bundles, 5.45c. base.



sheets are quiet at 2.70c., Pittsburgh, and 2.65c. is obtainable on desirable specifications. Galvanized sheets are quoted at 3.60c., Pittsburgh.

**Warehouse Business.**—Jobbers report a fair volume of small orders, which should, at the present rate, bring the total for May well up to the April shipments. Quantity differentials on bars, bar-size shapes, cold finished steel, hoops and bands are now being applied throughout the local warehouse territory and prices apparently are firm.

**Imports.**—A total of 537 tons of pig iron arrived at this port in the week ended May 19, 497 tons coming from India and 40 tons from Norway. Steel imports consisted of 326 tons of skelp, 155 tons of steel bars, 177 tons of shapes and 63 tons of bands from Belgium, and 42 tons of shapes and 9 tons of bars from France.

## New York

### Steel Buying at a Slower Pace—Pig Iron Less Active

NEW YORK, May 22.—Pig iron buying dropped sharply during the week, possibly because of the foundry exhibition at Philadelphia, and sales in this district totaled only 7000 tons. A New Jersey company, which was in the market for 1000 to 2000 tons of No. 1X, has bought, but otherwise sizable transactions have been lacking. The Worthington Pump & Machinery Corporation, New York, is inquiring for 125 tons of Bessemer and 225 tons of foundry iron for early delivery at Harrison, N. J. The General Electric Co. is asking for prices on 400 tons of No. 2X for shipment to Schenectady, N. Y. Two New England inquiries call for 1000 tons of foundry each. A buyer in this district has not yet taken action on an inquiry for 2000 tons of malleable. Eastern Pennsylvania producers continue to quote \$20, base furnace, on foundry iron without getting much business in this district. Buffalo foundry iron remains unchanged at \$16 to \$16.50, base furnace, with the occasional waiving of silicon differentials on large purchases. The Standish, N. Y., furnace, which had been expected to blow out, is still in blast.

#### Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	\$20.91 to \$21.91
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.39 to 22.52
East. Pa. No. 2X rdy., sil. 2.25 to 2.75	20.89 to 23.02
East. Pa. No. 1X rdy., sil. 2.75 to 3.25	21.39 to 23.52

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.

**Ferroalloys.**—Some sellers of ferromanganese report fairly heavy contracting for the second half at the new quotation of \$105, seaboard. There have also been some sales of carload and larger lots for delivery before July 1 at the new price. Business in spiegel-eisen is confined to frequent orders for carload and small lots, but specifications on contracts are satisfactory. Consumers of ferromanganese are specifying liberally on their first-half contracts and this is also true of ferrosilicon and ferrochromium under contracts made for the year.

**Finished Steel.**—The tendency in the local steel market is toward a slower pace. Consumers are ordering on a hand-to-mouth basis again whether in the form of specifications against contracts or otherwise. Some buyers who were, for example, taking lots of 100 tons at a time are now ordering in 10-ton lots. In the aggregate, however, business is fairly good, excepting such products as plates, sheets and wire nails. Eastern plate mills have distinctly felt a falling off in business in the last few weeks and their operations are slightly lower. Demand for sheets seems to have declined along with the drop in prices, while the situation in wire nails is that jobbers' stocks are still ample to take care of demands from their trade and not much new business is developing. In nearly all lines individual orders are too small to bring about much of a test of prices. Sheets continue weak, but there have been no further declines. Galvanized sheets are more easily

obtainable at 3.55c., Pittsburgh, while most of the business in black sheets is at 2.70c. Blue annealed sheets continue at 2c. to 2.10c., Pittsburgh. Fabricated structural lettings are light, but the amount of work in prospect is constantly growing. An inquiry is out for an office building on John Street calling for 4000 tons. Approximately 90,000 tons is involved in the following projects which will probably be up for bids before mid-summer: Reynolds Building, Forty-second Street and Lexington Avenue, which has been postponed for two months, 17,000 tons; hotel at Lexington Avenue and Forty-eighth Street, 2500 tons; ninth unit of Tudor City, 5000 tons; Tietjens warehouse for Baltimore & Ohio and Lehigh Valley railroads at Eleventh and Thirteenth Avenues and Twenty-sixth and Twenty-seventh Streets, 16,000 tons; building for News Syndicate, Inc., at 216-224 East Forty-second Street, 8000 to 10,000 tons; Western Union Building, 6000 tons; New Yorker Hotel, 9000 tons; Lincoln Building, Madi-

### Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes.....	3.30c.
Soft steel bars and small shapes.....	3.25c.
Iron bars.....	3.24c.
Iron bars, Swedish charcoal.....	7.00c. to 7.25c.
Cold-finished shafting and screw stock—	
Rounds and hexagons.....	3.40c.
Flats and squares.....	3.90c.
Cold-rolled strip, soft and quarter hard,	5.15c. to 5.40c.
Hoops.....	4.50c.
Bands.....	4.00c.
Blue annealed sheets (No. 10 gage).....	3.90c.
Long terme sheets (No. 24).....	5.80c.
Standard tool steel.....	12.00c.
Wire, black annealed.....	4.50c.
Wire, galvanized annealed.....	5.15c.
Tire steel, 1½ x ½ in. and larger.....	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and	
larger.....	3.65c.
Open-hearth spring steel, bases.....	4.50c. to 7.00c.
Machine bolts, cut thread: Per Cent Off List	
¾ x 6 in. and smaller.....	.55 to 60
1 x 30 in. and smaller.....	.50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller.....	.55 to 60
¾ x 20 in. and smaller.....	.50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller.....	.55 to 60
1 x 16 in. and smaller.....	.50 to 50 and 10
Boiler Tubes— Per 100 Ft.	
Lap welded steel, 2-in.....	\$17.33
Seamless steel, 2-in.....	20.24
Charcoal iron, 2-in.....	25.00
Charcoal iron, 4-in.....	67.00

#### Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt.....	46	29
¾-in. butt.....	51	37
1-3-in. butt.....	53	39
2½-6-in. lap.....	48	35
7 and 8-in. lap.....	44	17
11 and 12-in. lap.....	37	12
Wrought Iron—		
½-in. butt.....	5	+19
¾-in. butt.....	11	+9
1-1½-in. butt.....	14	+6
2-in. lap.....	5	+14
3-6-in. lap.....	11	+6
7-12-in. lap.....	3	+16

#### Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box.....	\$6.45	\$6.20
Charcoal, per box—	A	AAA
IC.....	\$9.70	\$12.10
IX.....	12.00	14.25
IXX.....	13.90	16.00

#### Terne Plate (14 x 20 in.)

IC—20-lb. coating.....	\$10.00 to \$11.00
IC—30-lb. coating.....	12.00 to 13.00
IC—40-lb. coating.....	13.75 to 14.25

#### Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
No. 18 to 20.....	3.80c.
No. 22.....	3.95c.
No. 24.....	4.00c.
No. 26.....	4.10c.
No. 28*.....	4.25c.
No. 30.....	4.50c.

#### Sheets, Galvanized

	Per Lb.
No. 14.....	4.35c.
No. 16.....	4.20c.
No. 18.....	4.35c.
No. 20.....	4.50c.
No. 22.....	4.55c.
No. 24.....	4.70c.
No. 26.....	4.95c.
No. 28*.....	5.20c.
No. 30.....	5.60c.

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.



son Avenue and Forty-second Street, 15,000 tons; loft building for H. Uris at Thirty-eighth Street and Seventh Avenue, 5000 tons. Manhattan Towers Hotel and church at Broadway and Seventy-seventh Street, 2100 tons, and Market Plaza Hotel in Newark, 3000 tons. An apartment hotel at Thirty-ninth Street and Park Avenue has been postponed indefinitely.

Mill prices per lb., delivered New York: Soft steel bars, 2.19c. to 2.24c.; plates, 2.12½c. to 2.22½c.; structural shapes, 2.14½c. to 2.19½c.; bar iron, 2.14c.

**Cast Iron Pipe.**—Although most producers are only moderately well provided with orders, prices are being maintained with considerable firmness by both Northern and Southern makers. Northern foundries are quoting \$38.60 per ton, delivered New York, on the smaller sizes of pipe, while Birmingham makers are maintaining \$31 and \$33 per ton, base, which with a \$9.25 per ton freight rate to New York brings the delivered prices above the market here. Hartford, Conn., opens bids June 4, on about 400 tons of 6 to 16-in. water pipe. Bids have been opened by Belmar, N. J., on a contract including about 700 tons of pipe. A Trenton, N. J., contractor is understood to have been low bidder. There are some export inquiries in the market, one of which calls for about 2300 tons of small sizes for shipment to the Dutch East Indies.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, \$37.60 to \$38.60; 4-in. and 5-in., \$42.60 to \$43.60; 3-in., \$52.60 to \$53.60; Class A and gas pipe, \$4 to \$5 extra.

**Reinforcing Bars.**—A building for the New York Dock Co. in Brooklyn will require about 2500 tons of bars; 700 tons will be needed for a section of the subway in that borough. About 500 tons has been placed recently for subway work in Manhattan and a slightly larger tonnage has been let for road work in New Jersey. The somewhat more active market has had little effect on the price situation. Distributors are quoting 2c., Pittsburgh, but 1.95c. is more common on sizable jobs. Warehouse prices are unchanged.

**Warehouse Business.**—Orders are smaller and less numerous than earlier in the month, and jobbers in this district are beginning to doubt that the total for May will be as large as the April figure. Small concessions are still being offered on black and galvanized sheets, and there are occasional reports of shading of about \$1 a ton on structural material.

**Coke.**—Another special brand of foundry coke has been reduced to a basis of \$4.85 per net ton, so that the market on these brands is now \$4.85 to \$5 per ton, ovens. Only occasional carload lots are being booked for prompt shipment. The New England producer of by-product coke has opened its books for second half, contracting on a basis of price prevailing at time of shipment. Delivered prices on special brands of foundry coke are: To northern New Jersey, Jersey City and Newark, \$8.56 to \$8.71 per net ton; to New York and Brooklyn, \$9.44 to \$9.49 per net ton. By-product foundry coke ranges from \$9 to \$9.40 per net ton, Newark or Jersey City, N. J., and from \$10.06 to \$10.29 per ton, New York or Brooklyn.

**Old Material.**—Mixed borings and turnings are being bought by brokers at \$10 per ton, delivered Steelton, Pa., on the basis of a recent purchase by a consumer at \$10.50 per ton. On old contracts for borings and turnings, \$10.50 per ton is still being paid in a few cases. Stove plate for steel mill use is being bought at \$11 per ton, delivered to a Harrisburg, Pa., user and

at \$11.25 per ton, delivered to Phoenixville, Pa. All grades of scrap are lacking in strength, and there is apparently no scarcity of material, even at the present level of the market.

Dealers' buying prices per gross ton f.o.b. New York:

No. 1 heavy melting steel.....	\$10.00 to \$10.85
Heavy melting steel (yard).....	6.75 to 7.25
No. 1 heavy breakable cast.....	11.25 to 12.00
Stove plate (steel works).....	7.25 to 7.50
Locomotive grate bars.....	7.50 to 8.00
Machine shop turnings.....	6.25 to 7.25
Short shoveling turnings.....	6.25 to 7.25
Cast borings (blast furnace or steel works).....	6.25 to 7.25
Mixed borings and turnings.....	6.25 to 7.25
Steel car axles.....	15.00 to 15.50
Iron car axles.....	23.75 to 24.75
Iron and steel pipe (1 in. dia., not under 2 ft. long).....	8.00 to 8.50
Forge fire.....	6.50 to 6.75
No. 1 railroad wrought.....	10.00 to 10.50
No. 1 yard wrought, long.....	8.50 to 9.00
Rails for rolling.....	10.00 to 10.50
Cast iron carwheels.....	11.00 to 11.50
Stove plate (foundry).....	8.50 to 9.00
Malleable cast (railroad).....	10.00
Cast borings (chemical).....	10.75 to 11.25

Prices per gross ton, delivered local foundries:

No. 1 machinery cast.....	\$13.50 to \$14.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	11.50 to 12.00
No. 2 cast (radiators, cast boilers, etc.).....	11.00 to 11.50

## Cleveland

### May Steel Business Holds Up Fairly Well —Sheets Continue Weak

CLEVELAND, May 22.—Specifications for steel bars are coming out in fair volume, largely from the automotive industry, but there is not much new demand and this is limited to small lots for early needs. Structural material is moving fairly well, but plates are very dull. While the market as a whole is not very active, the volume of business in May will show up well as compared with April, when specifications fell off sharply, following the heavy volume of orders late in March against expiring contracts. One large producer reports that its orders so far this month show a gain of more than 50 per cent over the same period in April.

The Otis Steel Co. has taken 1000 tons of plates for 35 Erie Railroad locomotives awarded to the Baldwin Locomotive Works. However, little work is developing in this territory requiring round lots of plates. Some new steel bar business is coming from the Michigan territory, but consumers are not buying very far ahead. Some seem to feel that they may be able to buy at lower prices later.

A small order for steel bars for water shipment to Detroit was taken by a Cleveland mill. With a saving in freight rate, the steel will cost the consumer approximately 2c., delivered, compared with 2.14c. when shipped by rail from a Pittsburgh district mill.

Reports from Detroit indicate that, with only one or two exceptions, there has been no slowing down in the automotive industry.

The Wheeling & Lake Erie Railroad has placed 1000 tons of rails with a Pittsburgh district mill, this order being supplemental to its original order for 1928 requirements.

No deviations are reported from regular quotations of 1.85c., Pittsburgh, for steel bars, plates and structural material and 1.85c., Cleveland mill, for steel bars.

**Pig Iron.**—The market has a slightly weaker tone on foundry and malleable grades. For shipment in competitive sections, the recent minimum Cleveland furnace quotation of \$16.50 is being shaded 25c. a ton and a local producer is reported to have gone as low as \$16 on one large lot for the last half. The Michigan market, which has held firmly at \$18, furnace, for some time, is now represented by a price range of \$17.50 to \$18. For Cleveland delivery, \$18 is still quoted. Cleveland interests sold 18,000 tons during the week. Not much inquiry is pending, as few consumers are showing an interest in the last half. Among inquiries is one for 1000 tons from an Akron manufacturer of heating equipment. The Corrigan, McKinney Steel Co. placed a furnace in blast May 18 and is now operating all four of its Cleveland stacks. Shipments are hold-

### Warehouse Prices, f.o.b. Cleveland

	Base per lb.
Plates and structural shapes.....	3.00c.
Soft steel bars.....	3.00c.
Reinforcing steel bars.....	2.25c. to 2.75c.
Cold-finished rounds and hexagons.....	3.65c.
Cold-finished flats and squares.....	4.15c.
Hoops and bands.....	3.65c.
Cold-finished strip.....	5.95c.
Black sheets (No. 24).....	3.75c.
Galvanized sheets (No. 24).....	4.40c. to 4.50c.
Blue annealed sheets (No. 10).....	3.25c.
No. 9 annealed wire, per 100 lb.....	\$2.85
No. 9 galvanized wire, per 100 lb.....	3.30
Common wire nails, base per keg.....	2.85

\*Net base, including boxing and cutting to length.

ing up to recent volume, but a slowing down in the demand from the automotive industry is looked for shortly.

*Prices per gross ton at Cleveland:*

N'th'n No. 2 fdy., sil. 1.75 to 2.25.....	\$18.50
Southern fdy., sil. 1.75 to 2.25.....	\$21.50 to 22.00
Malleable .....	18.50
Ohio silvery, 8 per cent.....	28.00
Basic, Valley furnace.....	16.00
Standard low phos., Valley furnace.....	26.50

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6 from Birmingham.

**Iron Ore.**—There is very little activity in the ore market. Furnaces consumed 4,781,205 tons of Lake ore in April, a decrease of 26,870 tons, compared with March. During April, last year, the consumption was 5,018,834 tons. The amount of ore on hand at furnaces May 1 amounted to 14,387,793 tons. The amount at furnaces and Lake Erie docks on that day was 19,570,181 tons, compared with 20,752,613 tons on the same date a year ago. Central district furnaces consumed 2,364,779 tons last month, an increase of 44,218 tons over April consumption, and Eastern furnaces consumed 76,949 tons, an increase of 2012 tons. Lake front furnaces used 2,220,256 tons, a loss of 68,847 tons, and all-rail furnaces consumed 119,221 tons, a decrease of 4343 tons. On April 31 there were 168 furnaces in blast using Lake ore, a gain of one for the month. The vessel rates for carrying ore prevailing last year have been reestablished for this season. The rates are 70c. a ton from the head of Lake Superior and 63c. from Marquette to Lake Erie and Lake Michigan ports, 52½c. from Escanaba to Lake Erie ports and 42c. from Escanaba to Lake Michigan ports.

**Sheets.**—The demand for auto body sheets, from the Detroit territory particularly, continues in good volume. While there has been a slowing down in orders from some sources, this seems to have been offset by larger specifications from the Ford Motor Co. In this territory, the demand is rather slow. Some of the mills have specifications to keep them operating at close to capacity for three or four weeks, but others need orders, and there has been some curtailment in operations. Prices continue weak except on auto body sheets, which are holding to 4c., Pittsburgh. While minimum quotations are no lower than during the previous week or two, the lower prices have become more general. Black sheets are being freely offered at 2.65c., Pittsburgh, and 2.70c. to 2.75c., Valley. Blue annealed sheets are commonly quoted at 2c., both Pittsburgh and Valley base. A quotation of 1.90c., Pittsburgh, appears occasionally, but this is evidently for wide material that competes with hot-rolled strip and plates. On galvanized sheets, there are quotations of 3.50c., Pittsburgh, and 3.55c., Valley. One Cleveland jobber has reduced its price to 3.60c., Valley, for car lots.

**Strip Steel.**—Specifications for hot-rolled strip are fair, but new business is light. The base price is not well defined, as net prices are often being quoted. However, 1.75c., Pittsburgh, appears to be commonly recognized as the base price for material 6 in. to 12 in. and wider. On strip narrower than 6 in., there is a range of from 1.85c. up to 2.10c. On cold-rolled strip, 2.75c., Cleveland, is the ruling price for large lot buyers. Fender stock has settled down to 4.10c., Cleveland.

**Reinforcing Bars.**—New inquiry is slow. It has developed that the Union Terminals work, Cleveland, for which bids were taken today, will require 1600 to 1700 tons instead of 800 tons as previously reported. Rail steel bars are unchanged at 1.75c., mill.

**Warehouse Business.**—The demand is slow from all consuming industries. Price concessions appear occasionally on structural shapes, these being attributed to fabricators who are moving surplus stocks. The seasonal demand for galvanized sheets is not up to normal.

**Nails and Wire.**—Manufacturers' wire is moving well to consumers engaged in automotive work, and the market is firm at 2.50c., Cleveland. Nail specifications continue rather light. The regular \$2.65 price is being maintained in the northern Ohio territory for most consumers.

**Semi-Finished Steel.**—While there has been some talk in the Valley district of an advance of \$1 a ton

on sheet bars for the third quarter, a local mill continues to quote these at \$33, Cleveland. Billets and slabs are the same price. Specifications continue heavy, but there is little new business.

**Alloy Steel.**—Makers have advanced series 3200 nickel chromium steel \$7 a ton to 4c. per lb. by increasing the differential on the grade from 1c. to 1.35c. The price of this grade was 4.75c. before the adoption a few weeks ago of the new method of quoting prices with a base and a differential, and it is claimed that the 3.65c. net price that has been prevailing since the revision was out of line with the prices on other grades. Orders from the automotive industry continue at about the recent volume.

**Bolts, Nuts and Rivets.**—The demand for bolts and nuts from the automotive industry is holding up well and considerable business is coming in for oil tank work. The demand is only slightly below that during April. Rivets are in light demand and manufacturers are unable to accumulate a backlog. Current orders are scarce. Prices are well maintained on both lines of products.

**Coke.**—New demand is very light. Shipments on contracts are only fair. The present price of \$7.75, f.o.b. Painesville, for Ohio by-product foundry coke probably will be named for June shipments. Connells-ville foundry coke ranges from \$3.85 to \$4.85 for standard brands.

**Old Material.**—A Cleveland mill has purchased 15,000 tons of scrap, including heavy melting steel and blast furnace grades, paying about the prices that have been prevailing recently. Dealers are paying \$13 and \$12.50 respectively for Nos. 1 and 2 heavy melting steel to fill their new orders from this mill. Blast furnace scrap is weaker. Considerable tonnage has been placed by dealers at \$9.10 to \$9.35, although this material in some cases is still bringing \$9.50. No. 1 cast scrap is 25c. a ton lower.

*Prices per gross ton, delivered consumers' yards:*

Basic Open-Hearth Grades		
No. 1 heavy melting steel.....	\$13.00 to	\$13.25
No. 2 heavy melting steel.....	12.50 to	12.75
Compressed sheet steel.....	12.50 to	13.00
Light bundled sheet stampings.....	11.50 to	11.75
Drop forge flashings.....	11.50 to	11.75
Machine shop turnings.....	7.00 to	7.50
No. 1 railroad wrought.....	11.50 to	12.00
No. 2 railroad wrought.....	13.50 to	13.75
No. 1 busheling.....	11.00 to	11.25
Pipes and flues.....	9.00 to	9.50
Steel axle turnings.....	12.50 to	13.00
Acid Open-Hearth Grades		
Low phosphorus forging crops.....	16.50 to	17.00
Low phosphorus, billet, bloom and slab crops.....	17.00 to	17.50
Low phosphorus sheet bar crops.....	16.50 to	17.00
Low phosphorus plate scrap.....	16.00 to	16.50
Blast Furnace Grades		
Cast iron borings.....	9.15 to	9.35
Mixed borings and short turnings.....	9.15 to	9.35
No. 2 busheling.....	9.15 to	9.35
Cupola Grades		
No. 1 cast.....	16.25 to	16.75
Railroad grate bars.....	11.00 to	12.00
Stove plate.....	12.00 to	12.50
Rails under 3 ft.....	16.75 to	17.25
Miscellaneous		
Railroad malleable.....	15.00 to	15.50
Rails for rolling.....	16.25 to	16.50

## Exports and Imports Continue at High Daily Rate

WASHINGTON, May 22.—Exports of iron and steel products from the United States in April totaled 215,184 gross tons, a decrease of 6750 tons from March, and imports aggregated 72,329 tons, a decline of 1799 tons from the preceding month, according to preliminary figures of the iron and steel division, Department of Commerce. The average daily export total for April, however, was 7173 tons, as against 7159 tons in March, while the average daily import movement in April was 2411 tons, as compared with 2391 tons in March.

The principal products exported, in point of tonnage, were scrap, 40,616 tons; heavy rails, 23,513 tons; tin plate, 19,809 tons; and plain shapes, 13,653 tons. The largest imports were pig iron, 20,845 tons; shapes, 16,577 tons; cast iron pipe, 6566 tons; and "other" pipe, 6211 tons, consisting chiefly of seamless tubes.



## San Francisco

### Sheet Prices Reduced \$3 a Ton— Structural Awards 1500 Tons

SAN FRANCISCO, May 19 (By Air Mail).—Buying of iron and steel products during the past week was by no means heavy, most consumers ordering only for their immediate needs. Structural shapes were again the most active product, though awards did not exceed 1500 tons. Included among lettings were 600 tons of shapes for the Smith River bridge in California, placed with the Virginia Bridge & Iron Co., and 445 tons of plates for a pipe line at Monrovia, Cal., secured by the Western Pipe & Steel Co. Sheet prices were reduced \$3 a ton this week.

Eugene G. Grace, president Bethlehem Steel Corporation, has been on the Coast for the past 10 days and among other things that he has taken under consideration is the advisability of establishing steel warehouses in Los Angeles, San Francisco, Portland and Seattle. The leading interest for some years has maintained large stocks at San Francisco, Los Angeles and Seattle.

**Pig Iron.**—Sales of foundry iron were confined to small lots. Inquiry is negligible. Foundry operations, especially among the jobbing class, have shown little or no improvement. Quotations are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	.....	\$25.00 to \$26.00
*Utah foundry, sil. 2.75 to 3.25	.....	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	.....	24.00 to 25.00
**German foundry, sil. 2.75 to 3.25	.....	24.25

\*Delivered San Francisco.

\*\*Duty paid, f.o.b. cars San Francisco.

**Bars.**—Awards of reinforcing steel bars totaled less than 1300 tons, the largest booking being secured by the Northwest Steel Rolling Mills and calling for 1000 tons for the Peck & Hills Furniture Co. warehouse in Seattle. Distributors report a fair volume of small-sized inquiries, but few large lots are up for figures. Approximately 1500 tons is involved in the Wildcat and Sequoia aqueducts at Oakland and will be purchased by the Lock Joint Pipe Co. of Ampere, N. J., general contractor. The price situation in the bay district continues unsettled, and lower than 2c. on out-of-stock material is being quoted in many instances.

**Plates.**—Coast plate fabricators have received two severe setbacks during the past 10 days. The aqueducts in Oakland for the East Bay Municipal Utility, which would have required more than 8000 tons of plates had steel pipe been purchased, will be built of reinforced concrete, and the city of Tacoma just placed an order with the Western Concrete Pipe Co. for 54 and 66-in. pipe, alternate bids having been taken on riveted steel pipe involving 1600 tons of material. The Moore Dry Dock Co. took 250 tons for a dredger for the Harbor Commission at San Francisco, the Birchfield Boiler Co. secured 115 tons for 48-in. pipe for Tacoma and the Pittsburgh-Des Moines Steel Co. booked 445 tons for the Horseshoe and Morrison Canyon siphons of the Yakima project in Washington. Pending business includes two car floats, one for the Santa Fe and the other for the Western Pacific, each requiring 700 tons. In addition, 1500 tons of No. 14 gage blue annealed sheets for the steel lining of the Wildcat and Sequoia aqueducts are pending. Prices remain firm at 2.30c., c.i.f.

**Shapes.**—Structural bookings totaled less than 1500 tons. Inquiries include 300 tons for an office building at Long Beach, Cal., and 200 tons for a school warehouse in San Francisco. Working drawings on a large

number of office buildings and apartments in Los Angeles and San Francisco are being prepared.

**Cast Iron Pipe.**—Several fair-sized cast iron pipe awards were reported this week. The United States Cast Iron Pipe & Foundry Co. booked 1050 tons of 4 to 12-in. class B pipe for Monrovia, Cal. Livingston, Cal., placed 275 tons of 2 to 10-in. class 150 pipe with James Currie, Burlingame, Cal. Pasadena, Cal., placed 333 tons as follows: to the National Cast Iron Pipe Co., 182 tons of 8-in., class 150, and to the Pacific States Cast Iron Pipe Co. 151 tons of 6-in., class 350. Inquiries consist of 634 tons of 4 to 10-in. class B or centrifugal pipe for the Monte Vista (Cal.) County Water District, 127 tons of 4 and 6-in. class B for Redwood City, Cal., bids on which open May 21, and 229 tons of 4 to 10-in. class B for Inglewood, Cal., bids May 21. Prices continue around \$35 to \$36 a ton, delivered, on 6-in. and larger.

**Standard Pipe.**—Demand for standard tubular products and oil country goods is quiet, especially so for this time of the year. Few inquiries for line pipe are before the trade for figures. The Standard Oil Co., San Francisco, has recently come into the market for a number of small lots of standard pipe, but individual inquiries have seldom exceeded 50 or 60 tons. The Grinnell Co. secured 625 tons of 6-in. seamless pipe for the city of Los Angeles, quoting 55.88c. per ft. The Ducommun Corporation, Los Angeles, was low on 193 tons of ½ to 4-in. standard pipe. The Monte Vista County Water District, Cal., is taking bids on several hundred tons of 2 to 10-in. lapweld and standard pipe, the principal item being 78,000 ft. of 2-in. standard.

**Sheets.**—Prices have lost some of their recent strength, and 4.25c., 3.45c. and 2.62c., c.i.f., are now being quoted respectively on No. 24 gage galvanized, No. 24 gage black and No. 10 blue annealed sheets. The previous levels were \$3 a ton higher. Demand has improved somewhat but consumers continue to order in small lots.

## Birmingham

### Pig Iron Shipments Improve—Steel Buying Continues in Good Volume

BIRMINGHAM, May 22.—Shipments of pig iron have increased. Two producers are now shipping more than their make, while in the case of a third shipments are keeping pace with production. May production to date is approximately the same as for the corresponding period in April. From the standpoint of new business, the pig iron market is no more active than it has been in the last few weeks. Soil pipe makers are expected to come into the market in two or three weeks. For this immediate district, quotations on foundry iron remain at \$16, base, and furnace interests are confident of a steady market for the remainder of the quarter. Eighteen furnaces remain in blast, 11 on foundry iron, five on basic, one on recarburizing iron and one on ferromanganese.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil....	\$15.50 to \$16.00
No. 1 foundry, 2.25 to 2.75 sil....	16.00 to 16.50
Basic .....	15.00

**Finished Steel.**—Consumers showed more tendency toward closing contracts during the past week, and sales in several lines were slightly in excess of those of the preceding week. No change is seen in the volume of inquiries. The market for sheets is still dull. Supplemental tonnage on railroad accessories is playing a large part in maintaining the volume of new business. The Ingall Iron Works Co. has an order for 1500 tons of fabricated structural steel for a new textile plant at Waycross, Ga. Structural steel fabricators and bar manufacturers report business dull. Open-hearth operations are the same as for the past four weeks; the Tennessee company is operating seven at Ensley and four at Fairfield, and the Gulf States Steel Co. has four on at Alabama City.

**Cast Iron Pipe.**—Pressure pipe buying during the past week dropped back to a nominal amount of small-order business. Inquiries on important municipal tonnage are developing from time to time. Plants are

### Warehouse Prices f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes.....	3.15c.
Soft steel bars .....	3.15c.
Small angles, ½-in. and over.....	3.15c.
Small angles under ½-in. ....	3.55c.
Small channels and tees, ¾-in. to 2¾-in. ....	3.75c.
Spring steel, ¼-in. and thicker.....	5.00c.
Black sheets (No. 24) .....	4.95c.
Blue annealed sheets (No. 10) .....	3.90c.
Galvanized sheets (No. 24) .....	5.50c.
Structural rivets, ½-in. and larger.....	5.65c.
Common wire nails, base per keg.....	\$3.40
Cement coated nails, 100-lb. keg.....	3.40



operating at about 80 per cent capacity, and shipments are in keeping with production. In some instances pipe has been moved from stock. The base prices of \$31 to \$33 show a tendency toward firmness.

**Coke.**—The lack of demand is attributed to seasonal dullness and previous bookings by important consumers. Shipments against contracts are fair. Quotations remain at \$5.

**Old Material.**—Following the recent reduction of prices on several lines, a somewhat improved demand is noticeable. New business is confined to small orders. Prices are unchanged.

*Prices per gross ton, delivered Birmingham district consumers' yards:*

Heavy melting steel.....	\$9.00 to	\$9.50
Scrap steel rails.....	11.00 to	11.50
Short shoveling turnings.....	7.50 to	8.00
Cast iron borings.....		8.00
Stove plate.....		13.50
Steel axles.....	19.00 to	20.00
Iron axles.....	20.00 to	21.00
No. 1 railroad wrought.....	10.00 to	10.50
Rails for rolling.....		13.00
No. 1 cast.....		14.25
Tramcar wheels.....	12.50 to	13.50
Cast iron carwheels.....	12.00 to	13.00
Cast iron borings, chemical.....	13.50 to	14.00

## St. Louis

### Pig Iron Weakened by Reduction at Chicago—Steel Operations High

ST. LOUIS, May 22.—The reduction of 50c. a ton on Northern pig iron made by Chicago interests to meet the competition of Lake Erie iron has caused a weakness in the market here, although the St. Louis Gas & Coke Corporation still is selling at \$19, Granite City furnaces. One Southern maker has reduced its price 50c. a ton, but this cut has not been met by the leading interest in that section. The melt in the district is being curtailed by several of the larger mills. There is renewed activity among stove foundries, now that they have decided on their patterns for the next season. The Granite City maker sold 4600 tons during the week, including 600 tons of malleable to one northern Illinois melter and 500 tons to another. The remainder was foundry grades, including two 300-ton orders for Illinois melters and 250 tons to a western Missouri concern.

*Prices per gross ton at St. Louis:*

No. 2 fdy., sil. 1.75 to 2.25, f.o.b.	
Granite City, Ill.....	\$19.00
Northern No. 2 fdy., delivered	
St. Louis.....	20.16
Southern No. 2 fdy., delivered.....	\$19.92 to 20.42
Northern malleable, delivered.....	20.16
Northern basic, delivered.....	20.16

Freight rates: 81c. from Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

**Coke.**—With a reduction in the melt of pig iron has come a lessening in the demand for industrial grades of coke in this district. Dealers have been buying fairly well of domestic grades.

**Finished Iron and Steel.**—A slight improvement in the demand for galvanized sheets is reported by the Granite City Steel Co., and it is this producer's belief

#### Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes.....	3.25c.
Bars, soft steel or iron.....	3.15c.
Cold-finished rounds, shafting and screw stock.....	3.75c.
Black sheets (No. 24).....	4.45c.
Galvanized sheets (No. 24).....	5.25c.
Blue annealed sheets (No. 10).....	3.60c.
Black corrugated sheets (No. 24).....	4.50c.
Galvanized corrugated sheets.....	5.30c.
Structural rivets.....	3.75c.
Boiler rivets.....	3.75c.
	Per Cent Off List
Tank rivets, $\frac{7}{8}$ -in. and smaller, 100 lb. or more.....	70
Less than 100 lb.....	65
Machine bolts.....	60
Carriage bolts.....	60
Lag screws.....	60
Hot-pressed nuts, squares, blank or tapped, 200 lb. or more.....	60
Less than 200 lb.....	50
Hot-pressed nuts, hexagons, blank or tapped, 200 lb. or more.....	60
Less than 200 lb.....	50

that the demand will increase during the next few weeks. The company continues well fortified with backlog tonnages on virtually all of its other products, and in the case of tin mill sheets sufficient business is booked to warrant 100 per cent operation for several weeks. Demand in the oil fields is at a low ebb. No large lots of freight cars are being inquired for, but it is understood that some roads may buy freight equipment in the near future. Reinforcing bar awards for the week totaled 185 tons, and the only project of consequence pending is a sewer, which will require 300 tons.

**Old Material.**—A leading East Side interest bought about 4000 tons of specialties and melting rails from several dealers to average down the price of its raw materials, and it is understood would have bought more, but dealers considered the offers too low. Interest by some mills in No. 1 machinery cast, and railroad malleable, brought dealers' prices up 50c. a ton, and for the same reason No. 1 busheling is up 25c. a ton. No. 1 railroad cast is off 50c. a ton and miscellaneous rails are 25c. a ton lower. Railroad lists include: Chicago & Alton, 1000 tons; St. Louis & Hannibal, 600 tons; Louisville & Nashville, 440 tons of cast iron and 533 tons of bridge material; Pullman Co. (St. Louis), 6 carloads; Chicago, Rock Island & Pacific, 180 carloads.

*Dealers' buying prices, per gross ton, f.o.b. St. Louis district:*

Heavy melting steel.....	\$11.25 to \$11.75
No. 1 locomotive tires.....	12.00 to 12.50
Heavy shoveling steel.....	11.25 to 11.75
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart.....	12.50 to 13.00
Railroad springs.....	13.75 to 14.25
Bundled sheets.....	8.75 to 9.25
No. 2 railroad wrought.....	11.25 to 11.75
No. 1 busheling.....	9.75 to 10.25
Cast iron borings.....	9.00 to 9.50
Iron rails.....	13.00 to 13.50
Rails for rolling.....	13.00 to 13.50
Machine shop turnings.....	7.00 to 7.50
Steel car axles.....	17.50 to 18.00
Iron car axles.....	23.50 to 24.00
Wrought iron bars and transoms.....	21.00 to 21.50
No. 1 railroad wrought.....	10.00 to 10.50
Steel rails, less than 3 ft.....	15.00 to 15.50
Steel angle bars.....	12.00 to 12.50
Cast iron carwheels.....	13.50 to 14.00
No. 1 machinery cast.....	13.50 to 14.00
Railroad malleable.....	11.50 to 12.00
No. 1 railroad cast.....	13.00 to 13.50
Stove plate.....	12.00 to 12.50
Agricultural malleable.....	12.00 to 12.50
Relaying rails, 60 lb. and under.....	20.50 to 23.50
Relaying rails, 70 lb. and over.....	26.50 to 29.00

## Buffalo

### Pig Iron Firmer for Outside Shipment —Galvanized Sheets 3.55c.

BUFFALO, May 22.—Extreme dullness marked the week's pig iron business. No sizable inquiries are before the makers. All report having taken a few 100-ton lots of foundry and malleable. Some business was placed at Auburn, N. Y., and Warren, Pa. The outstanding development of the week was the decision of one of the local makers, who has been active in Eastern business, to advance the base price on foundry iron for all delivery points to \$17, Buffalo furnace.

*Prices per gross ton, f.o.b. furnace:*

No. 2 plain fdy., sil. 1.75 to 2.25.....	\$17.00
No. 2 foundry, sil. 2.25 to 2.75.....	17.50
No. 1X foundry, sil. 2.75 to 3.25.....	18.50
Malleable, sil. up to 2.25.....	17.50
Basic.....	\$16.50 to 17.00
Lake Superior charcoal.....	27.28

**Finished Iron and Steel.**—Operations continue at the rate of recent weeks. New commitment on bars,

#### Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes.....	3.40c.
Soft steel bars.....	3.30c.
Reinforcing bars.....	2.75c.
Cold-finished flats, squares and hexagons.....	4.45c.
Rounds.....	3.95c.
Cold-rolled strip steel.....	5.85c.
Black sheets (No. 24).....	4.30c.
Galvanized sheets (No. 24).....	5.15c.
Blue annealed sheets (No. 10).....	3.80c.
Common wire nails, base per keg.....	\$3.65
Black wire base per 100 lb.....	3.90

shapes and plates are fair. The ruling price appears to be 2c., Lackawanna, with 1.95c. on sizable tonnage. Sheet business is off somewhat, most of it coming in on contracts. Black sheet prices are fairly firm at 2.80c. to 2.85c. The lowest price hereabouts has been 2.75c. on occasional lots. The automobile body sheet price is firm at 4c. On galvanized, most of the business is being taken at 3.55c. Bolt and nut demand is not quite so heavy. A third quarter price list, it is expected, will be announced soon. Reinforcing bar business is active; close to 2000 tons in sizable lots is pending. A fabricator took 200 tons of structural for a Binghamton concern. The new Rand Building, plans for which are awaited, will require 4500 tons of structural steel.

**Old Material.**—There has been a dearth of new buying and the market is soft and quiet. One of the principal consumers continues its order suspending shipments. Another large mill is receiving boat shipments of scrap from Detroit at the rate of at least one a week. This mill is consuming heavily. Machine shop turnings are off 25c.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel.....	\$14.50 to \$14.75
No. 2 heavy melting steel.....	12.50 to 13.00
Scrap rails.....	13.50 to 14.00
Hydraulic compressed sheets.....	12.50 to 13.00
Hand bundled sheets.....	8.50 to 9.00
Drop forge flashings.....	12.00 to 12.50
No. 1 busheling.....	13.25 to 13.75
Heavy steel axle turnings.....	12.50 to 12.75
Machine shop turnings.....	8.00 to 8.50
Acid Open-Hearth Grades	
Railroad knuckles and couplers..	15.50
Railroad coil and leaf springs...	15.50 to 16.00
Rolled steel wheels.....	15.00 to 15.50
Low phosphorus billet and bloom ends.....	16.50 to 17.00
Electric Furnace Grades	
Heavy steel axle turnings.....	12.75 to 13.25
Short shoveling steel turnings...	10.75 to 11.25
Blast Furnace Grades	
Short shoveling steel turnings...	10.50 to 11.00
Short mixed borings and turnings	9.50 to 10.00
Cast iron borings.....	9.25 to 9.75
No. 2 busheling.....	9.00 to 9.25
Rolling Mill Grades	
Steel car axles.....	17.00 to 17.50
Iron axles.....	22.00 to 23.00
No. 1 railroad wrought.....	12.50 to 13.00
Cupola Grades	
No. 1 machinery cast.....	14.50 to 15.00
Stove plate.....	13.50 to 13.75
Locomotive grate bars.....	12.00 to 12.50
Steel rails, 3 ft. and under.....	16.50 to 17.00
Cast iron car wheels.....	13.00 to 13.50
Malleable Grades	
Railroad.....	15.00
Agricultural.....	15.00
Industrial.....	15.00

## Boston

### Pig Iron Inquiry for Third Quarter— Scrap Market Weaker

BOSTON, May 22.—Although pig iron sales the past week dropped off noticeably, general sentiment among brokers is that improved buying will develop soon. A Vermont foundry is inquiring for 1000 tons of No. 1X for third quarter, and a Massachusetts melter wants 500 to 1000 tons, half No. 2 plain and half No. 1X, also for third quarter. These are the first important open inquiries in many weeks. In addition, sellers are negotiating with various foundries for sizable lots of iron, mostly No. 2X and No. 1X. Sales of pig iron in New England so far this month have approximated 25,000 tons, of which the Mystic Iron Works has taken more than 15,000 tons. In the past week that furnace booked an order for 2000 tons No. 2X and No. 1X for third quarter delivery, and about 1000 tons in small lots. Other furnaces did not do so well.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25.....	\$20.91 to \$21.91
Buffalo, sil. 2.25 to 2.75.....	21.41 to 22.41
East. Penn., sil. 1.75 to 2.25.....	23.15 to 23.65
East. Penn., sil. 2.25 to 2.75.....	23.65 to 24.15
Virginia, sil. 1.75 to 2.25.....	25.71
Virginia, sil. 2.25 to 2.75.....	26.21
Alabama, sil. 1.75 to 2.25.....	22.91 to 24.77
Alabama, sil. 2.25 to 2.75.....	23.41 to 25.27

Freight rates: \$4.91 from Buffalo, \$3.65 from eastern Pennsylvania, \$5.21 all rail from Virginia, \$6.91 to \$8.77 from Alabama.

**Importations.**—Pig iron importations during the first half of May were limited to 198 tons of Indian No. 2X. During the first half of April imports were 809 tons, while in the first half of May, last year, they were 641 tons; the first half of May, 1926, 1994 tons, and the first half of May, 1925, 2574 tons. A small amount of Belgian cast iron pipe, 92 pieces, was received in the first half of May, the first importation of this product in many weeks.

**Coke.**—On May 21, New England by-product foundry coke makers opened their books for last half contracts. As formerly, these contracts are subject to a sliding scale of prices, the price to be fixed on the first day of each month. Anticipating the opening of books, brokers rounded up regular customers, and consequently both the New England Coal & Coke Co. and the Providence Gas Co. have approximately 50 per cent of the consumers signed up. The current demand for coke is a little heavier than a week ago, indicating a gain in the New England melt of iron. The price remains at \$11 a ton, delivered within a \$3.10 freight rate zone.

**Cold-Rolled Strip.**—May will pass out a comparatively lean month with the cold-rolled strip makers. Buying during the first quarter was sufficiently heavy to carry consumers through most of the second three months. Better business is expected in June for third quarter delivery. Prices are holding at 3c. to 3.15c. per lb., base Pittsburgh, on 1 to 3 ton lots.

**Shapes and Plates.**—Bridge jobs predominate in the fabricated steel market. The State of Vermont and the Boston & Maine Railroad have inquired for a large number of such structures, though the tonnage of steel involved in each is not large. The market for standard shapes is 1.80c. to 1.90c. per lb., base Pittsburgh, depending on the tonnage involved. Buying of plates is on a hand-to-mouth basis, with prices steady and unchanged.

**Cast Iron Pipe.**—Open municipal inquiries for pipe are few. Quincy, Mass., has closed with the Warren Foundry & Pipe Co. for 160 tons of 6-in. pipe. Attleboro, Mass., instead of buying 100 tons of 6-in. pipe, bids for which were recently opened, took a car lot from an unnamed foundry. Private bookings are quite satisfactory. The market for 4-in. pipe is holding firm at \$46.10 to \$47.10 a ton, delivered common Boston freight rate points, and for 6-in. to 16-in., at \$41.10 to \$42.10. On larger sizes concessions are still obtainable. The usual \$5 differential is asked on class A and gas pipe.

**Old Material.**—Old material is moving more freely, but mostly at easier prices. Local exporters of yard steel have again lifted their price, this time 25c. a ton to \$9.75, making a total advance of 75c. within a fortnight. Two steamers have just departed for Danzig with approximately 8000 tons of scrap, and another is loading 4000 tons this week. In addition, a steamer is

### Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates.....	3.365c.
Structural shapes—	
Angles and beams.....	3.365c.
Tees.....	3.365c.
Zees.....	3.465c.
Soft steel bars and small shapes.....	3.265c.
Flats, hot-rolled.....	4.15c.
Reinforcing bars.....	3.265c. to 3.54c.
Iron bars—	
Refined.....	3.265c.
Best refined.....	4.60c.
Norway, rounds.....	6.60c.
Norway, squares and flats.....	7.10c.
Spring steel—	
Open-hearth.....	5.00c. to 10.00c.
Crucible.....	12.00c.
Tire steel.....	4.50c. to 4.75c.
Bands.....	4.015c. to 5.00c.
Hoop steel.....	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons.....	*3.45c. to 5.45c.
Squares and flats.....	*3.95c. to 6.95c.
Toe calk steel.....	6.00c.
Rivets, structural or boiler.....	4.50c.
Per Cent Off List	
Machine bolts.....	50 and 5
Carriage bolts.....	50 and 5
Lag screws.....	50 and 5
Hot-pressed nuts.....	50 and 5
Cold-punched nuts.....	50 and 5
Stove bolts.....	70 and 10

\*Including quantity differentials.

taking on 250 tons at Providence, R. I., mostly automobile steel, at \$9 a ton on dock, also for Danzig. Sales of No. 1 heavy melting steel for Pennsylvania delivery are reported at \$9.10 on cars, shipping point, but some business was taken in the past week at \$8.60, indicating further weakness in that material. Prices paid for No. 1 railroad wrought, steel mill borings and forge flashings are lower, while inside prices are paid more often than outside for other grades of scrap. The best offer made recently on shafting is \$11 a ton on cars, shipping point. Textile machinery cast sells at either \$13.75 or \$14 a ton, delivered, but the most some brokers will pay is \$13.50. No. 1 machinery cast continues to sell at a premium over textile cast.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$8.60 to \$9.10
Scrap T rails.....	8.50 to 9.00
Scrap girder rails.....	7.50 to 8.00
No. 1 railroad wrought.....	9.00 to 10.00
No. 1 yard wrought.....	7.00 to 7.50
Machine shop turnings.....	5.50 to 6.00
Cast iron borings (steel works and rolling mill).....	5.50 to 6.00
Bundled skeleton, long.....	5.50 to 6.00
Forge flashings.....	6.50 to 7.00
Blast furnace borings and turnings.....	5.75 to 6.25
Forge scrap.....	6.00 to 6.25
Shafting.....	13.00 to 13.50
Steel car axles.....	15.50 to 16.00
Wrought pipe 1 in. in diameter (over 2 ft. long).....	7.50 to 8.00
Rails for rolling.....	10.00 to 10.25
Cast iron borings, chemical.....	9.50 to 10.00

Prices per gross ton delivered consumers' yards:

Textile cast.....	\$13.50 to \$14.00
No. 1 machinery cast.....	14.50 to 15.00
No. 2 machinery cast.....	13.00 to 13.50
Stove plate.....	10.00 to 10.50
Railroad malleable.....	13.00 to 13.50

## Cincinnati

### Steel Demand Slows Up—Pig Iron Quiet—Coke Shipments Fall Off

CINCINNATI, May 22.—Pig iron sales in the week amounted to less than 3000 tons. Inquiries are scarce. Buying for third quarter is not yet under way, partly because there is no incentive in the price situation to justify forward purchasing and also because many consumers have not taken all of the tonnage on present contracts. Reports of low prices on both Northern and Southern iron are current, but in most instances are difficult to substantiate. Alabama and Tennessee makers insist that they are holding to \$16, base Birmingham, but iron has been offered to large consumers at 50c. under that figure. Northern Ohio iron is being sold at \$16.50, base furnace, and in several instances sellers are understood to have dipped as low as \$16. Contract users of Jackson County silvery iron are specifying against present requirements at a moderate rate, and prices are firm at \$25, base furnace, for 8 per cent. There has been no change in southern Ohio foundry, which remains at \$19, base Ironton. The Niles Tool Works Co., Hamilton, Ohio, is asking for 500 tons of Northern foundry, and a Mt. Vernon, Ill., melter is inquiring for a like amount of malleable. The fur-

nace of the Hamilton Coke & Iron Co., Hamilton, Ohio, was blown in on basic iron May 21.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25....	\$20.89
So. Ohio malleable.....	\$20.14 to 20.89
Alabama fdy., sil. 1.75 to 2.25....	19.19 to 19.69
Alabama fdy., sil. 2.25 to 2.75....	19.69 to 20.19
Tennessee fdy., sil. 1.75 to 2.25....	19.19 to 19.69
Southern Ohio silvery, 8 per cent.....	26.89

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

**Finished Material.**—There has been a curtailment of buying in the past week. Specifications against second quarter contracts have not been placed in the volume expected, and many sellers are directing their main efforts toward the correction of this condition. Numerous structural steel jobs scheduled to appear about this time have been indefinitely postponed, with the result that fabricators have little work on which they are figuring. Despite the slowness of the general market, bars, structural shapes and plates are firm at 1.85c., base Pittsburgh. The weakest spot in finished steel is wire products, which are being sold at low prices by an Ohio River producer. Common wire nails are reported to be bringing \$2.50 per keg, Ironton, and plain wire \$2.40 per 100 lb. This seller is now delivering to lower Ohio River points approximately 50 carloads of wire and nails by barge. In the sheet market, specifications and orders continue at a fairly good rate. Releases of substantial tonnages by automobile manufacturers have strengthened the situation somewhat, while the call for electrical sheets also has been active. Mill operations are holding up well and in some cases approach 90 to 95 per cent of capacity. There is no indication of a stiffening of prices, which remain at 2c. to 2.10c., base Pittsburgh, for blue annealed, 4c. for automobile body sheets, 3.65c. for galvanized and 2.75c. to 2.85c. for black stock.

**Warehouse Business.**—Jobbers report a moderate movement of bars, structural shapes and plates, but sheets and wire products are lagging. Prices in all commodities are showing strength.

**Coke.**—Declining specifications from automobile foundries have resulted in lessened shipments of by-product foundry coke, and indications are that the volume in May will fall off 10 per cent or more from that of April. Dealers are encouraged by the somewhat liberal movement of by-product domestic coke, which is considerably greater than in the spring of 1927. New River beehive foundry coke is steady at \$6.50 to \$7, ovens.

Foundry coke prices per net ton, delivered Cincinnati: By-product coke, \$9.02; Wise County coke, \$7.09 to \$7.59; New River coke, \$9.09 to \$9.59. Freight rates, \$2.14 from Ashland, Ky.; \$2.59 from Wise County and New River ovens.

**Old Material.**—Shipments to district steel plants have fallen off slightly, and dealers are of the opinion that the market during the next 30 days will be quiet. Demand for foundry grades has been slack. While quotations have not been changed, several of them are merely nominal.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$11.00 to \$11.50
Scrap rails for melting.....	11.25 to 11.75
Loose sheet clippings.....	8.25 to 8.75
Bundled sheets.....	9.25 to 9.75
Cast iron borings.....	8.00 to 8.50
Machine shop turnings.....	7.50 to 8.00
No. 1 busheling.....	10.00 to 10.50
No. 2 busheling.....	7.00 to 7.50
Rails for rolling.....	12.50 to 13.00
No. 1 locomotive tires.....	12.75 to 13.25
No. 1 railroad wrought.....	10.00 to 10.50
Short rails.....	15.75 to 16.25
Cast iron carwheels.....	12.25 to 12.75
No. 1 machinery cast.....	15.25 to 15.75
No. 1 railroad cast.....	12.75 to 13.25
Burnt cast.....	7.50 to 8.00
Stove plate.....	8.25 to 8.75
Brake shoes.....	9.50 to 10.25
Railroad malleable.....	11.50 to 12.00
Agricultural malleable.....	11.00 to 11.50

The American Sheet & Tin Plate Co. has completed a loading pier at its National (tin plate) works, Monessen, Pa., and has loaded a barge of tin plate for southern delivery, which will move in the next tow of steel products of the United States Steel Corporation taken south by the Carnegie Steel Co.

### Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes.....	3.40c.
Bars, soft steel or iron.....	3.30c.
New billet reinforcing bars.....	3.15c.
Rail steel reinforcing bars.....	3.00c.
Hoops.....	4.00c. to 4.25c.
Bands.....	3.95c.
Cold-finished rounds and hexagons.....	3.85c.
Squares.....	4.35c.
Black sheets (No. 24).....	4.05c.
Galvanized sheets (No. 24).....	4.90c.
Blue annealed sheets (No. 10).....	3.60c.
Structural rivets.....	3.85c.
Small rivets.....	.65 per cent off list
No. 9 annealed wire, per 100 lb.....	\$3.00
Common wire nails, base per keg.....	2.95
Cement coated nails, base 100 lb. keg.....	2.95
Chain, per 100 lb.....	7.55
Net per 100 Ft.	
Lap-welded steel boiler tubes, 2-in.....	\$18.00
4-in.....	38.00
Seamless steel boiler tubes, 2-in.....	19.00
4-in.....	39.00



## Canada

### Pig Iron Melters Showing More Interest—April Output Declined

TORONTO, Ont., May 22.—Production of pig iron in Canada during April amounted to 74,736 gross tons, a decline of 5 per cent from the 78,390 tons reported for March, and 4 per cent below the output of 77,240 tons in April, 1927. April figures show that the production of foundry iron advanced to 21,539 tons, from 5151 tons in March, while the output of basic iron declined to 52,346 tons from 67,162 tons in March, and malleable iron dropped to 851 tons from 6077 tons in March.

For the four months ended with April, the cumulative production of pig iron in this country totaled 282,823 gross tons, an increase of 12 per cent over the 255,289 tons produced in the first four months of last year, and 24 per cent over the 227,248 tons produced in the first third of 1926. This year's output consisted of 217,817 tons of basic iron, 54,411 tons of foundry iron, and 10,565 tons of malleable iron.

Production of steel ingots and castings in Canada during April amounted to 112,780 tons, compared with 118,258 tons in the previous month and 109,107 tons in April, 1927. For the four months ended with April, the total output of steel ingots and castings was 414,153 tons, or 26 per cent greater than the 330,659 tons produced in the first four months of last year, and 59 per cent above the 260,394 tons produced in the first third of 1926. This year's output consisted of 398,788 tons of ingots and 15,365 tons of direct steel castings.

The Dominion Bureau of Statistics price index for iron and its products (1913=100) remained unchanged at 141.7.

The Canadian Furnace Co., Port Colborne, Ont., has completed improvements at its blast furnace and ore docks and will put its furnace in blast on May 24. This is Queen Victoria's Day in Canada, and as the company's product is known as Victoria iron and the furnace is called the Victoria furnace, it was decided to begin operations on that day. The company's sales office is at Hamilton, Ont. George A. Simpson is sales manager.

**Pig Iron.**—Melters are beginning to show more interest in the market. During the past few days inquiries have been received by local dealers ranging from 500 to 1000 tons for delivery up to the middle of August. Current sales are chiefly for spot delivery and range from 50 to 200 tons. Prices are unchanged.

#### Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	\$23.10 to \$23.60
No. 2 foundry, sil. 1.75 to 2.25	23.10 to 23.60
Malleable	23.10 to 23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	24.50 to 25.00
No. 2 foundry, sil. 1.75 to 2.25	24.50 to 25.00
Malleable	24.50 to 25.00
Basic	24.00
Imported Iron at Montreal Warehouse	
Summerlee	33.50
Carron	33.00

**Old Material.**—Business was slightly better during the past week or 10 days. A number of good tonnage orders were included in recent sales. Current demand is chiefly from consumers who buy as demands dictate. The market, however, is spotty.

#### Dealers' buying prices:

Per Gross Ton		
	Toronto	Montreal
Heavy melting steel	\$9.00	\$8.00
Rails, scrap	10.00	10.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	6.00
Boiler plate	7.00	7.00
Heavy axle turnings	7.50	7.50
Cast borings	7.50	6.00
Steel turnings	7.00	6.50
Wrought pipe	5.00	6.00
Steel axles	14.00	19.00
Axles, wrought iron	16.00	21.00
No. 1 machinery cast	16.00	16.00
Stove plate	12.00	12.00
Standard carwheels	14.50	14.50
Malleable	13.00	13.00
Per Net Ton		
No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	....

## Detroit

### No Slackening in Automobile Production Yet Discernible

DETROIT, May 22.—While it is yet too early to get a close estimate on what May automobile production will total, indications reveal no slackening of the pace established last month.

The Employers' Association index shows a further increase in industrial employment of 2662, which brings the figure for the current week to 256,497. This figure indicates the number of persons on the combined payrolls of representative manufacturers, which account for two-thirds of the city's working population. A year ago the index figure stood at 226,228, or 30,269 less than at present.

W. S. Knudsen, president Chevrolet Motor Co., announced a final total of April production at 135,832 units, which sets a new all-time record and is approximately 2000 units ahead of the previous month and approximately 17,000 units ahead of February.

Changes in plant and equipment at the Hudson Motor Co. are being made to accommodate greater production. It is reported that an output of 2000 units per day is expected when alterations have been completed.

Willys-Overland began the current month with 35,000 unfilled orders on the books.

Retail sales for General Motors cars and trucks for April developed a new record of 209,367 units, against 183,706 for March and 180,106 for April, 1927. Retail sales for the first four months of the current year total 632,380 units, compared with 509,416 units in 1927 and 361,363 in 1926.

Edward G. Budd Mfg. Co. has been awarded about \$1,500,000 worth of work from Europe. Domestic contracts with the same company will run probably to about \$500,000 a month additional. Shipments for the first quarter of 1928 were \$7,955,000.

Hayes Body Corporation estimates deliveries for May, June and July at 60,000 bodies, against 26,000 for the same period of 1927.

Melters in this district are taking out their pig iron very close to the amounts contracted for, so it is expected there will be a buying movement of considerable proportions for the third quarter. Several inquiries involving a large tonnage have developed, but no sales have been made.

Prices on old material are the same as quoted a week ago.

#### Dealers' buying prices per gross ton f.o.b. cars, Detroit:

Heavy melting and shoveling steel	\$11.00 to \$11.50
Borings and short turnings	7.25 to 7.75
Long turnings	6.75 to 7.25
No. 1 machinery cast	14.00 to 15.00
Automobile cast	19.50 to 21.00
Hydraulic compressed sheets	9.75 to 10.25
Stove plate	11.00 to 12.00
No. 1 busheling	8.50 to 9.00
Sheet clippings	6.00 to 7.00
Flashings	9.25 to 9.75

### Ashland Steel Co. to Be Sold at Public Auction

The property of the Ashland Steel Co., Ashland, Ky., two-thirds of which is owned by the Belfont Steel & Wire Co., Ironton, Ohio, will be sold at public sale on order of the court, June 7. The property is being sold as the result of foreclosure proceedings brought by the bondholders as represented by the Ashland National Bank. O. D. Hayes of Ironton and T. A. Field of Ashland have been appointed receivers and special masters by the court and the sale will be made by them.

### Rail Steel Bar Association to Meet May 25

The Rail Steel Bar Association will hold its semi-annual meeting May 25 in New York, coincident with the spring meeting of the American Iron and Steel Institute. The former organization comprises a group of rolling mills in the United States and Canada producing rail steel reinforcing bars and other products. As an association its activities have been directed toward extending the use of reinforced concrete for construction.

# NON-FERROUS METAL MARKETS

## The Week's Prices

Cents per Pound  
for  
Early Delivery

	May 22	May 21	May 19	May 18	May 17	May 16
Lake copper, New York.....	14.62 1/2	14.62 1/2	14.62 1/2	14.62 1/2	14.62 1/2	14.50
Electrolytic copper, N. Y.*..	14.25	14.25	14.25	14.25	14.25	14.12 1/2
Straits tin, spot, N. Y. ....	51.50	51.37 1/2	...	51.75	51.75	52.32 1/2
Lead, New York.....	6.10	6.10	6.10	6.10	6.10	6.10
Lead, St. Louis.....	5.97 1/2	5.97 1/2	6.00	6.00	6.00	6.00
Zinc, New York.....	6.50	6.50	6.45	6.42 1/2	6.42 1/2	6.40
Zinc, St. Louis.....	6.15	6.15	6.10	6.07 1/2	6.07 1/2	6.05

\*Refinery quotation; delivered price 1/4c. higher.

NEW YORK, May 22.—Sales of copper continue large, with prices advancing. Tin has been exceedingly quiet, but quotations are steady. Dullness in the lead market persists at unchanged values. Higher prices for zinc have followed an advance in ore.

**Copper.**—So heavy has been the buying of copper the past two weeks that electrolytic copper is regarded by many as scarce, and most producers are sold up through June. Some buyers are attempting to obtain June copper and are having some trouble as well as anxiety, and some producers have been requested to anticipate June shipments thus early in May. Sales for export have been large in the last week, and it is safe to say that the total for the first three weeks of 65,000 to 70,000 tons is larger than any monthly total in the past. Foreign consumers must still buy metal for June and domestic consumers are not all covered even for July. The price of electrolytic copper was advanced about May 17 to 14.50c., delivered in the Connecticut Valley. No metal can be bought below that today and higher prices are being talked about. Copper Exporters, Inc., also advanced its quotation last week from 14.62 1/2c. to 14.75c., c.i.f. European ports, this being the second increase in less than 10 days. If the present pace of buying continues, only an increase in production can meet the situation. Lake copper is active and higher at 14.62 1/2c. to 14.75c., delivered.

**Tin.**—Only about 600 tons changed hands in the last week and the market has been exceedingly dull. Trading between dealers was at a minimum and consumers

were waiting for lower prices. Their expectations were met yesterday and today and their entry into the market may be expected shortly. The spot and May positions are still under close control and command a premium of about 1/2c. per lb. over May-June. It is figured that consumers still have considerable metal to buy for July-August. London prices today were considerably lower than a week ago, with spot standard quoted at £227 15s., future standard at £227 2s. 6d. and spot Straits at £232 5s. per ton. The market here today was not particularly active, with spot Straits tin quoted at 51.50c., New York. Arrivals thus far this month have been 5935 tons and 4585 tons is reported afloat.

**Lead.**—Buying continues in only moderate volume and the stability of the market is the only feature. Quotations are a little weaker in the West at 5.97 1/2c. to 6c., East St. Louis, for the outside market, but the leading interest continues to maintain its contract price at 6.10c., New York.

**Zinc.**—Ore producers at Joplin advanced the price to \$40 per ton last week and sold over 17,000 tons, thus reducing stocks materially. They are also limiting output and some refiners in the East are predicting still higher prices. The advance in ore has had some effect on the price of prime Western, which today is quoted at 6.15c., St. Louis, or 6.50c., New York. It is generally admitted that 6.25c., St. Louis, would be none too high with ore at \$40, and higher prices are naturally expected. Demand from consumers is light and producers, outside of taking care of their regular customers, are not pressing the market.

**Nickel.**—Wholesale lots of ingot nickel are quoted at 35c. with shot nickel at 36c. and electrolytic nickel at 37c. per lb.

**Antimony.**—With Chinese exchange higher and

## Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig.....	53.00c. to 54.00c.
Tin, bar .....	55.75c. to 56.75c.
Copper, Lake .....	15.50c.
Copper, electrolytic .....	15.25c.
Copper, casting .....	14.50c.
Zinc slab .....	7.00c. to 7.50c.
Lead, American pig.....	7.00c. to 7.50c.
Lead, bar .....	9.25c. to 10.25c.
Antimony, Asiatic .....	13.00c. to 13.50c.
Aluminum No. 1 ingots for remelting (guaranteed over 99 per cent pure).....	25.00c. to 26.00c.
Aluminum ingots, No. 12 alloy.....	24.00c. to 25.00c.
Babbitt metal, commercial grade.....	30.00c. to 40.00c.
Solder, 1/2 and 3/4 .....	33.25c. to 34.25c.

## Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig.....	56.50c.
Tin, bar .....	58.50c.
Copper, Lake .....	14.85c.
Copper, electrolytic .....	14.85c.
Copper, casting .....	14.00c.
Zinc slab .....	7.50c.
Lead, American pig.....	6.95c.
Antimony, Asiatic .....	16.00c.
Lead, bar .....	9.25c.
Babbitt metal, medium grade.....	18.50c.
Babbitt metal, high grade.....	60.50c.
Solder, 1/2 and 3/4 .....	32.75c.

## Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

<b>Sheets—</b>	
High brass .....	19.00c.
Copper, hot rolled.....	23.25c.
Copper, cold rolled, 14 oz. and heavier.....	25.50c.
<b>Seamless Tubes—</b>	
Brass .....	23.87 1/2c.
Copper .....	24.75c.
Brazed Brass Tubes.....	27.00c.
Brass Rods .....	16.75c.

## From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks.....	9.50c. to 10.00c.
Zinc sheets open.....	10.50c. to 11.00c.

## Non-Ferrous Rolled Products

Mill prices on copper products except copper tubing were advanced 1/4c. on May 17. A corresponding advance on copper tubing and brass products was made on May 15. Zinc sheets and lead full sheets are unchanged.

## List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

<b>Sheets—</b>	
High brass .....	19.00c.
Copper, hot rolled.....	23.25c.
Zinc .....	9.00c.
Lead (full sheets).....	9.75c. to 10.00c.
<b>Seamless Tubes—</b>	
High brass .....	23.87 1/2c.
Copper .....	24.75c.
<b>Rods—</b>	
High brass .....	16.75c.
Naval brass .....	19.50c.
<b>Wire—</b>	
Copper .....	16.25c.
High brass .....	19.50c.
Copper in Rolls.....	22.25c.
Brazed Brass Tubing.....	23.00c.

## Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 2 to 30 in. wide.....	33.00c.
Tubes, base .....	42.00c.
Machine rods .....	34.00c.

## Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Consumers' Doors in City Limits)

Sheets—	Base per Lb.
High brass .....	19.00c.
Copper, hot rolled.....	23.25c.
Copper, cold rolled, 14 oz. and heavier.....	25.50c.
Zinc .....	10.00c.
Lead, wide .....	9.75c.
Seamless Tubes—	
Brass .....	25.37½c.
Copper .....	26.25c.
Brazed Brass Tubes.....	27.00c.
Brass Rods .....	16.75c.

firm, Chinese metal is quoted steady at 11c. to 11.25c. for all positions. Buying is only in moderate volume.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, is quoted at 23.90c. per lb., delivered.

## Non-Ferrous Metals at Chicago

CHICAGO, May 22.—This market is moderately active and prices for copper and zinc have advanced. Quotations on tin are lower. Fair activity is noted in the old metal market and prices are steady.

Prices, per lb., in carload lots: Lake copper, 14.62½c.; tin, 52.50c.; lead, 6.10c.; zinc, 6.25c.; in less-than-carload lots, antimony, 12.75c. On old metals we quote copper wire, crucible shapes and copper clips, 10.50c.; copper bottoms, 9.50c.; red brass, 9.25c.; yellow brass, 7c.; lead pipe, 4.75c.; zinc, 3.25c.; pewter, No. 1, 30c.; tin foil, 36c.; block tin, 45c.; aluminum, 11.75c.; all being dealers' prices for less-than-carload lots.

## REINFORCING STEEL

### Awards of 5375 Tons—Inquiries for 7750 Tons Include One Lot of 2500 Tons

A NUMBER of small projects made a total of reinforcing steel jobs awarded during the week of 5375 tons. The total of new projects now under negotiation is about 7750 tons, of which 2500 tons is for a building for the New York Dock Co. in Brooklyn and 1000 tons is for a building for the Continental Can Co. at Chicago. Awards follow:

NEW YORK-VERMONT, 1000 tons, Lake Champlain bridge, to unnamed Middle West company.  
BOSTON, 100 tons, Falkner Hospital, to C. S. Henry & Co.  
BOSTON, 150 tons, foundations for Boston & Maine warehouse, to Kalman Steel Co.  
STATE OF CONNECTICUT, 150 tons of road mesh, to Concrete Steel Co.  
MAMARONECK, N. Y., 125 tons, water filtration plant, to Joseph T. Ryerson & Son, Inc.  
NEW YORK, 200 tons, one section of subway; from Moranti & Raymond, Inc., general contractor, to Concrete Steel Co.  
NEW YORK, 350 tons, terminal warehouse for Central Railroad of New Jersey; from White Construction Co., general contractor, to Concrete Steel Co.  
JONES BEACH, LONG ISLAND, 150 tons, causeway paving for New York State Highway Department; from Connors Brothers, Long Beach, N. Y., general contractor, to Concrete Steel Co.  
STATE OF NEW JERSEY, 250 tons, road work in Monmouth and Mercer counties, to Igoe Brothers.  
CHICAGO, 100 tons, building for General Tire & Rubber Co., to Concrete Steel Co.; previously reported at 500 tons to an unnamed bidder.  
CORWITH, ILL., 200 tons, building for Crane Co., to Jones & Laughlin Steel Corporation.  
CHICAGO, 200 tons of rail steel bars, laboratory at University of Chicago, to Inland Steel Co.  
CHICAGO, 125 tons of rail steel bars, building for Republic Food Products Co., to Calumet Steel Co.  
CHICAGO, 190 tons of rail steel bars, Fair Oaks garage, to Calumet Steel Co.  
STATE OF ILLINOIS, 400 tons of rail steel bars for roadwork, to Calumet Steel Co.  
MILWAUKEE, 400 tons, St. Mary's College, to Concrete Engineering Co.  
STATE OF WISCONSIN, 100 tons, road work, to Olney J. Dean & Co.  
ST. LOUIS, 175 tons, warehouse for Independent Plumbing Supply Co., to Laclede Steel Co.

## Old Metals, Per Lb., New York

The buying prices represent what the large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible.....	12.25c.	13.75c.
Copper, heavy and wire.....	12.00c.	13.125c.
Copper, light and bottoms...	10.25c.	11.50c.
Brass, heavy .....	7.00c.	8.50c.
Brass, light .....	6.00c.	7.50c.
Heavy machine composition.	9.50c.	10.75c.
No. 1 yellow brass turnings.	8.00c.	9.25c.
No. 1 red brass or composition turnings .....	9.00c.	10.00c.
Lead, heavy .....	5.00c.	5.50c.
Lead, tea .....	4.00c.	4.50c.
Zinc .....	3.00c.	3.50c.
Sheet aluminum .....	12.75c.	14.50c.
Cast aluminum .....	12.50c.	14.00c.

GRANITE CITY, ILL., 110 tons of billets and bars, high school, to Laclede Steel Co.

SEATTLE, WASH., 1000 tons, Peck-Hills Furniture Co. warehouse, to Northwest Steel Rolling Mills.

## Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 300 tons, Lee Brothers warehouse; Turner Construction Co., general contractor.  
BROOKLYN, 2500 tons, building for New York Dock Co.; Russell G. Cory, architect.  
BROOKLYN, 700 tons, subway section 2-A, route 109; Rodgers & Hagerty, Inc., general contractor.  
BINGHAMTON, N. Y., 500 tons, Ansco Building; Turner Construction Co., general contractor.  
STATE OF NEW JERSEY, 100 tons, road work; D. H. Winans, Elizabeth, general contractor.  
BUFFALO, 278 tons, School No. 81; bids taken.  
BUFFALO, 800 to 1000 tons, five-span bridge over Cazenovia Creek; bids June 5, city engineer's office.  
BUFFALO, 125 tons, Cornelius Creek drain.  
BUFFALO, 500 tons, road-bed and canopy, New York Central station; bids asked.  
CHICAGO, 1000 tons, building for Continental Can Co.; Wells Brothers, general contractors.  
CHICAGO, tonnage not stated, reconstruction of Fine Arts Building; Great Lakes Construction Co., low bidder on general contract.  
CHICAGO, 120 tons, Nurses' Home for the city of Chicago; Great Lakes Construction Co., low bidder on general contract.  
CHICAGO, 270 tons, steam tunnel for University of Chicago.  
URBANA, ILL., 160 tons, testing laboratory for University of Illinois.  
ST. LOUIS, 300 tons, Rocky Branch sewer for Board of Public Service.

## Railroad Equipment

Erie Railroad has ordered 35 2-8-4 type locomotives from Baldwin Locomotive Works.

Boston & Maine is inquiring for two eight-wheel switching locomotives.

Ferrocarril de Pacifico, Colombia, S. A., has ordered 10 4-S-0 type locomotives from Baldwin Locomotive Works and Ferrocarril de Antioquia, Colombia, has ordered four Mikado-type locomotives from same company.

Detroit & Toledo Shore Line has withdrawn its inquiry for 100 gondola bodies.

North American Car Co. has purchased 500 used tank cars. This does not affect company's inquiry for 500 new tank cars. This company is also inquiring for 50 to 100 steel underframes.

Chicago, Milwaukee, St. Paul & Pacific will build 10 baggage cars in its own shops.

Virginian Railway has ordered 1000 hopper car bodies from Virginia Bridge & Iron Co.

Hainesport Mining & Transportation Co. has ordered four 50-ton steel hopper cars from American Car & Foundry Co. Central of Brazil has ordered eight sleeping cars, two buffet baggage cars and 10 steel passenger cars from American Car & Foundry Co.

Chicago, South Shore & South Bend has purchased 10 rail motor cars from Standard Steel Car Co.

Northern Pacific has ordered three gas-electric rail motor cars from Standard Steel Car Co. and one from J. G. Brill Co.

Guayaquil & Quito Railroad, Ecuador, has ordered 50 box cars from American Car & Foundry Co.

Cincinnati Street Railway Co. has ordered 100 electric passenger cars from Cincinnati Car Co.



## FABRICATED STRUCTURAL STEEL

### Small Jobs Predominate in Week's Awards of 23,500 Tons—26,750 Tons On Inquiry

STRUCTURAL steel awards during the week, as reported to THE IRON AGE, were about 23,500 tons, of which 5800 tons of miscellaneous work in New York is outstanding. For a building in Minneapolis, 2000 tons was awarded, and 1700 tons was let for a lift bridge at Chicago. Among inquiries totaling 26,750 tons, those of largest size are 4000 tons for an office building in New York, 3500 tons for a high school building in Chicago and 3000 tons for an office building in Buffalo. Awards follow:

BIDDEFORD, ME., 800 tons, Boston & Maine Railroad bridge, to Phoenix Bridge Co.  
 BOSTON, 1000 tons, Boston & Maine Railroad terminal building, to Levering & Garrigues.  
 LOWELL, MASS., 700 tons, Boston & Maine Railroad bridge, to Boston Bridge Works, Inc.  
 HOLYOKE, MASS., 400 tons, Boston & Maine Railroad bridge, to Boston Bridge Works, Inc., and Phoenix Bridge Co., jointly.  
 QUINCY, MASS., 200 tons, mercantile building, to New England Structural Co.  
 STATE OF MASSACHUSETTS, 322 tons, Boston & Maine Railroad bridges at Grantville, North Littleton, Brookside and Westford, to Boston Bridge Works, Inc.  
 BINGHAMTON, N. Y., 200 tons, new plant for Agfa Ansco Corporation, to Kellogg Structural Steel Co.  
 NEW YORK, 5800 tons in the following awards reported to the Structural Steel Board of Trade, Inc.: St. Paul's Baptist Church on West 132nd Street, warehouse at 153 East Eighty-seventh Street and restaurant and loft building at 977 Eighth Avenue, to George A. Just Co.; loft building at 259 West Thirtieth Street, apartment building at Ninety-third and Ninety-fourth Streets and Park Avenue and addition to building 85 of Western Electric Co. at Kearny, N. J., to McClintic-Marshall Co.  
 STATE OF NEW JERSEY, 110 tons, five highway bridges, to American Bridge Co.  
 PHILADELPHIA, 500 tons, theater, to McClintic-Marshall Co.  
 PHILADELPHIA, 125 tons, Goldfine Garage, to Shoemaker Bridge Co.  
 PENNSYLVANIA RAILROAD, 250 tons, bridges, to American Bridge Co.  
 POTTSVILLE, PA., 150 tons, high school, to McClintic-Marshall Co.  
 NEWARK, DEL., 130 tons, University of Delaware extension, to Jones & Laughlin Steel Corporation.  
 STANDARD OIL CO. OF LOUISIANA, 600 tons, various projects, to an unnamed fabricator.  
 WAYCROSS, GA., 1500 tons, plant for Troy Cotton & Woolen Manufactory, Fall River, Mass., to Ingalls Iron Works Co., Birmingham.  
 DAYTON, OHIO, 100 tons, Oakwood Manor Apartments, to Massillon Bridge & Structural Co.  
 TROY, OHIO, 232 tons, building for Advance Aircraft Co., to Massillon Bridge & Structural Co.  
 STATE OF MICHIGAN, 100 tons, highway bridges in Genesee County, to Massillon Bridge & Structural Co.  
 LOGANSPORT, IND., 400 tons, Pennsylvania Railroad bridge, to Bethlehem Steel Co.  
 FORT WAYNE, IND., 400 tons, building for International Harvester Co., to McClintic-Marshall Co.  
 CHICAGO, 200 tons, Simon Building, to Mississippi Valley Structural Steel Co.  
 CHICAGO, 200 tons, building at 234 South Wabash Avenue, to American Bridge Co.  
 CHICAGO, 180 tons, building for American Can Co., to McClintic-Marshall Co.  
 CHICAGO, 400 tons, building for Harris Brothers Co., to McClintic-Marshall Co.  
 CHICAGO, 225 tons, building at 226 South Wabash Avenue, to unnamed bidder.  
 CHICAGO, 1700 tons, lift bridge for Baltimore & Ohio Railroad, to Mount Vernon Bridge Works.  
 CHICAGO, 950 tons, building for Crane Co., to American Bridge Co.  
 CHICAGO, BURLINGTON & QUINCY RAILROAD, 150 tons, I-beam spans, to an unnamed bidder.  
 STATE OF ILLINOIS, 440 tons, highway bridges, to Milwaukee Bridge Co.  
 MINNEAPOLIS, 2000 tons, Foshay Tower Building, to Duffin Iron Co., Chicago; this in addition to 2000 tons recently awarded to Minneapolis Steel & Machinery Co. for first four floors.  
 FOND DU LAC, WIS., 600 tons, St. Mary's School, to Milwaukee Bridge Co.  
 DENVER, COLO., 445 tons, plates, siphons for Horseshoe and Morrison Canyon, Yakima project in Washington, to Pittsburgh-Des Moines Steel Co.  
 SAN FRANCISCO, 140 tons, apartment, Pine near Gough Street, to McClintic-Marshall Co.

SAN FRANCISCO, 250 tons of plates and 250 tons of shapes, dredger for State Harbor Commission, to Moore Dry Dock Co.  
 SAN FRANCISCO, 125 tons, barge for Shasta-Butte Gold Dredging Co., to Dyer Brothers.  
 SAN FRANCISCO, 120 tons, warehouse, Fifteenth and Vermont Streets, to Schraders Iron Works.  
 SACRAMENTO, CAL., 600 tons, bridge over Smith River in Del Norte County, to Virginia Bridge & Iron Co.  
 MONROVIA, CAL., 445 tons, plates for 12 to 20-in. pipe, to Western Pipe & Steel Co.  
 TACOMA, WASH., 115 tons, plates, 48-in. pipe line, to Birchfield Boiler Co.

### Structural Projects Pending

Inquiries for fabricated steel work include the following:

STATE OF VERMONT, 580 tons, 18 bridges.  
 BOSTON, 100 tons, Diocesan House, 1 Joy Street.  
 BOSTON, 100 tons, Community House, Roxbury district.  
 BOSTON & MAINE RAILROAD, 1000 tons, bridges.  
 NEW YORK, 4000 tons, office building on John Street; Starret Brothers, general contractors.  
 NEW YORK, 400 tons, building for Rockefeller Institute on Avenue A.  
 PHILADELPHIA, 150 tons, highway bridge at Abbottsford Avenue; Jaffola & Mark, Inc., low bidder on general contract.  
 PHILADELPHIA, 105 tons, highway bridge at Cottman Avenue; Horridge, Elcock & Hall, Inc., low bidder on general contract.  
 PHILADELPHIA, 2000 tons, apartment building at Nineteenth and Locust Streets.  
 PENNSYLVANIA RAILROAD, 300 tons, bridges.  
 BALTIMORE, 500 tons, Y. M. C. A.  
 WASHINGTON, 400 tons, train shed for Pennsylvania Station.  
 BUFFALO, 3000 tons, office building for Marine Trust Co. at Washington Street and Lafayette Square; John W. Cowper Co., general contractor.  
 DETROIT, 1000 tons, research laboratory for General Motors Corporation.  
 CHICAGO, 3500 tons, Austin High School; Great Lakes Construction Co., low bidder on revised quotations.  
 CHICAGO, 1600 tons, office building to be erected by Patterson estate.  
 CHICAGO, tonnage being estimated, building for Bowman Dairy Co.  
 GARY, IND., 600 tons, court building; A. Bolter's Sons, Chicago, low bidders.  
 ROCK ISLAND, ILL., 500 tons, 40 steel pontoons for United States Engineers Corps; Midland Barge Co., Midland, Pa., low bidder.  
 ANDERSON, IND., 800 tons, foundry for Delco-Remy Corporation.  
 URBANA, ILL., 450 tons, Lincoln Hall at University of Illinois.  
 LOUISVILLE, KY., 1500 tons, highway bridge.  
 SAN ANTONIO, TEX., 1600 tons, theater.  
 MARINETTE, WIS., 350 tons, Interstate bridge to Menominee, Mich.; bids close June 8.  
 PORTAGE, WIS., 160 tons, new Dewitt Street bridge; Worden-Allen Co., Milwaukee, low bidder.  
 MILWAUKEE, 200 tons, St. Mary's College buildings; bids about July 1; Herbst & Kuenzli, 130 Wisconsin Avenue, Milwaukee, architects.  
 MILWAUKEE, 300 tons, new Lincoln Avenue span; general contract to Klug & Smith Co., Milwaukee.  
 SAN FRANCISCO, 200 tons, school warehouse on Harrison Street.  
 OAKLAND, 1500 tons, No. 14-gage blue annealed sheets for Wildcat and Sequoia aqueducts; sub-bids by Lock-Joint Pipe Co., Ampere, N. J.  
 TACOMA, WASH., 1600 tons plates, 51 to 66-in. riveted pipe, to Western Concrete Pipe Co. on basis of reinforced concrete pipe.  
 LONG BEACH, CAL., 300 tons, office building, Pine and Ocean Avenues; bids being taken.

### Orders for Fabricated Steel Plates Gain

WASHINGTON, May 22.—Orders for fabricated steel plates in April totaled 48,493 tons, or 60.7 per cent of the capacity of the 51 firms reporting to the Department of Commerce. This compares with 45,505 tons, or 57 per cent of capacity, in March.

April orders were distributed as follows: Oil storage tanks, 21,330 tons; refinery materials and equipment, 2370 tons; tank cars, 4344 tons; gas holders, 4654 tons; blast furnaces, 619 tons; stacks and miscellaneous, 15,176 tons.

Orders for the first four months of the present year aggregated 179,605 tons, as against 198,251 tons for the corresponding period of last year.

## PERSONAL

Loyall A. Osborne, president Westinghouse Electric International Co., was reelected chairman of the National Industrial Conference Board, Inc., at its twelfth annual meeting last week at the Hotel Astor, New York. The following were among the vice-chairmen named: Irene du Pont, chairman of finance committee, E. I. du Pont de Nemours & Co., Wilmington, Del., and Herbert F. Perkins, International Harvester Co., Chicago. The executive committee will include the following: William D. Baldwin, Otis Elevator Co., New York; Cornelius F. Kelley, Anaconda Copper Mining Co., New York, and William H. Nichols, Jr., General Chemical Co., New York.



L. A. OSBORNE

Norman E. Craig has been made district manager at New York for Hickman, Williams & Co., succeeding Charles S. Garland, who recently resigned. Mr. Craig has been identified with Hickman, Williams & Co. since February, 1917, and was in the company's Pittsburgh office until June, 1926, when he was transferred to the New York office.

Frank M. Beeson, for several years in charge of the Los Angeles branch of the Luitweiler Pumping Engine Co., has been placed in charge of a new office which has been opened at 808 Pacific National Bank Building, Los Angeles, by the Graver Corporation, East Chicago, Ind. The Luitweiler company had formerly been Pacific Coast distributor of the Graver organization.

John R. Williams has been elected president of the Electric Storage Battery Co., Philadelphia, succeeding Herbert Lloyd, who has been made chairman of the board.

E. F. Entwisle, who has been assistant general manager of the Steelton plant of the Bethlehem Steel Corporation, has been appointed superintendent of the Saucon plant, Bethlehem, Pa., succeeding S. J. Cort, who has been appointed assistant general manager of the Maryland plant. R. B. Gerhardt, who has been assistant general manager of the Maryland plant, becomes assistant general manager at Steelton.

C. F. Niemann, president Parkersburg Iron & Steel Co., Parkersburg, W. Va., has been elected a director of the Colonial Trust Co., Pittsburgh.

T. P. Gaylord, vice-president Westinghouse Electric & Mfg. Co., has been reelected president of the Chamber of Commerce of Pittsburgh.

W. S. Unger, who has been assistant superintendent Carrie furnaces, Carnegie Steel Co., Rankin, Pa., has been appointed superintendent, succeeding J. E. Lose, recently appointed assistant general superintendent Homestead works.

Louis T. Lott has rejoined the Weirton Steel Co., Weirton, W. Va., and will serve as assistant general manager of sales in the strip steel department.

B. I. Ashmun, since 1893 associated with the Armstrong Mfg. Co., Bridgeport, Conn., manufacturer of pipe stock, dies, cutters, etc., has been made president of the company, and his son, Frederick S. Ashmun,

has been named secretary-treasurer. The latter is a grandson of Frank Armstrong, who founded the business in 1869. Coincident with the change in the company's management the New York sales and general export offices were removed to larger quarters at 27 Cleveland Place at Spring and Lafayette Streets, which will be shared with the Self Propelling Nozzle Co. Leslie H. Taylor, for many years sales manager for the Williams Pipe Threading Machine Co., Erie, Pa., has been placed in charge of sales in the Middle West for the Armstrong company and has opened an office at 9 South Clinton Street, Chicago.

B. R. Sausen, since 1918 associated with the Binks Spray Equipment Co., Chicago, at first in charge of the design and development of spray equipment and subsequently as general sales manager, has been placed in charge of the paint spray equipment department of the Alexander Milburn Co., Baltimore. He is a graduate in mechanical engineering from the University of Minnesota and gained his early mechanical experience with the Westinghouse Electric & Mfg. Co., East Pittsburgh.

H. R. Sykes has been made manager of sales in the locomotive division, Cincinnati Car Co., Winton Place, Cincinnati. The company makes Diesel, gasoline, electric and gas-electric locomotives for industrial uses.

Robert M. Derby, manager of foreign sales for the Niles-Bement-Pond Co. and Pratt & Whitney Co., 111 Broadway, New York, sailed May 11, for a trip of several months in European countries. The day of his departure was the occasion for a luncheon given him by the members of his department to commemorate the fifteenth anniversary of its establishment and his 25 years of service with the Niles-Bement-Pond Co.

W. W. Lower, who has been secretary and treasurer of the National Association of Sheet and Tin Plate Manufacturers and of the recently organized National Association of Flat Rolled Steel Manufacturers, has resigned and his duties have been assumed by E. T. Sproull, who has been commissioner of the Cold Rolled Strip Steel Institute and who has been affiliated with the Flat Rolled Steel organization as head of the Cold Rolled Strip division. The sheet steel statistical work heretofore handled by Mr. Lower will also be under Mr. Sproull's direction.

Clayton L. Patterson, who for nine years has been secretary of the Bureau of Labor of the National Association of Sheet and Tin Plate Manufacturers, and for the past four years secretary of the Sheet Steel Trade Extension Committee, has tendered his resignation of both positions, effective May 31.

W. P. Bradley, Wheeling Mold & Foundry Co., Wheeling, V. Va., has been nominated for president of the Pittsburgh Foundrymen's Association, L. W. Mesta, Mesta Machine Co., West Homestead, Pa., for vice-president, and William J. Brant, for secretary-treasurer. C. D. Carey, American Steel Foundries, Verona, Pa.; L. V. Stevens, Standard Stoker Co., Pittsburgh; W. J. McMillen, Mackintosh-Hemphill Co., Pittsburgh; L. A. Glaser, McKenna Brass & Mfg. Co., Pittsburgh, and Robert N. Cook, Eclipse Pattern Co., Pittsburgh, have been nominated for members of the executive committee. They will be elected at the annual meeting to be held at the Chamber of Commerce of Pittsburgh, Thursday evening, May 24.

John F. Tinsley, vice-president and general manager Crompton & Knowles Loom Works, Worcester, Mass., and Mrs. Tinsley are visiting Italy. Later they expect to visit France and England, returning late in June.

W. D. Moore, president, and J. T. MacKenzie, chief chemist and metallurgist of the American Cast Iron Pipe Co., Birmingham, will speak on "Centrifugal Testing of Cast Iron Pipe," before the Quad-City Foundrymen's Association, May 28, at the Davenport, Iowa, Chamber of Commerce.



H. O. Coe has been appointed manager of the Cleveland office of the United States Electrical Tool Co., with quarters at 403 Erie Building. For the last eight years he has been identified with the sales department of the W. Bingham Co., Cleveland jobber, and previously was engaged in the retail hardware business.

J. V. Moore, formerly with the Simonds Saw & Steel Co., Fitchburg, Mass., is now representing the Billings & Spencer Co., Hartford, Conn., in Pennsylvania, Delaware and New Jersey. His headquarters are at the Leister House, Huntingdon, Pa.

L. V. Quigg, superintendent of the Franklin plant at Johnstown, Pa., of the Bethlehem Steel Co., has resigned to become general superintendent, effective June 1, of the Colorado Fuel & Iron Co., at Pueblo, Colo.

H. J. G. Rudolf has been placed in charge of the factory and laboratory of the Winslow Boiler & Engineering Co., Galesburg, Ill., following a reorganization of that company's plant and personnel. William H. Rehm, president of the company, has taken over the duties of general manager, and T. C. Kyle has been appointed sales manager.

C. A. Heiser, formerly assistant sales manager of the Southwest General Electric Supply Co., Dallas, Tex., has been appointed district manager at Dallas by the Oliver Iron & Steel Corporation, Pittsburgh. He will represent the line material and the bolt, nut and rivet departments of the Oliver corporation and will have headquarters at 409 Browder Street.

David Thomas has been appointed manager of bar iron sales for the Reading Iron Co., Reading, Pa., manufacturer of wrought iron tubular and bar iron products.

F. W. Hawkins has resigned as superintendent of the blooming and bar mills of the Trumbull Steel Co., Warren, Ohio, now being absorbed in the Republic Iron & Steel Co.

E. D. Pike, for 26 years associated with the Wagner Electric Corporation, St. Louis, most recently in charge of the company's Pacific Coast service operations, has been appointed manager of the San Francisco branch sales office, 457 Ninth Street. He is a graduate of Washington University, St. Louis, and has served the company in various capacities at New York, Philadelphia, St. Louis and San Francisco.

E. E. Gregg has been placed in charge of the new hoist and body division of the Commercial Shearing & Stamping Co., Youngstown. Ward Beecher, heretofore connected with sales engineering activities, has been placed in charge of all sales promotional enterprises.

John P. Hubbell, until May 1 assistant chief of research for the New Jersey Zinc Co., has become a partner in Singmaster & Breyer, 420 Lexington Avenue, New York, chemical engineers and metallurgists. He is a graduate of Williams College and Columbia University, and, prior to his nine years' connection with the Zinc company, he was with the General Chemical Co. and in the gas defense division of the United States Army.

Alfred H. Wilson, Jr., formerly assistant metallurgist in charge of the laboratory and special heat treating department of Henry Disston & Sons, Inc., has become associated with Horace C. Knerr, consulting metallurgical engineer, Philadelphia.

Boyd Nixon has become associated with the Louis G. Henes organization, distributors of machine tools and supplies, with offices in San Francisco and Los Angeles. Mr. Nixon, who will be connected with the San Francisco office, was with Harron, Rickard, McCone Co., San Francisco, from 1905 to 1914; with the Niles-Bement-Pond Co. and Pratt & Whitney in Cleveland from 1915 to 1919; he was sales manager of the St. Paul office of Niles-Bement-Pond Co. and Pratt & Whitney from 1919 to 1924; and sales manager of the

Philadelphia office of the two companies since that time.

William W. Neckerman, superintendent of tube mills of the Youngstown Sheet & Tube Co., was appointed general manager of the Republic Iron & Steel Co. He succeeds J. W. Deetrick, who recently resigned. Mr. Neckerman has been with the Sheet & Tube company 21 years and is regarded as one of the country's foremost authorities on steel pipe mill operations, controlling important patents in his own name. The Republic company has also named W. J. Mossman, who has been with the Chicago offices of the Sheet & Tube company, as general purchasing agent, succeeding Sidney H. Hedges.

Clyde MacCornack, general manager and chief engineer of the Phoenix Bridge Co., Phoenixville, Pa., has been appointed treasurer and general manager, being succeeded as chief engineer by J. R. Lambert, his assistant. William T. Hodge, sales manager, has been elected secretary of the company, a position which has been unfilled since the death of George Gerry White about a year ago.

J. H. Brillhart, formerly vice-president Fort Worth Steel & Machinery Co., Fort Worth, Tex., has resigned his position with that company, and with the assistance of some friends, has organized the Fort Worth Structural Steel Co. He is a graduate of Lehigh University, was chief engineer for Guerber Engineering Co., Bethlehem, Pa., from 1906 to 1912, then chief engineer and consulting engineer for Mosher Mfg. Co., Dallas and Houston, until 1922, since which time he has been vice-president and manager of the structural steel and tank departments of the Fort Worth Steel & Machinery Co.

H. B. Carpenter, for the past four years general superintendent Colorado Fuel & Iron Co., has resigned, effective June 1, to become assistant to the general manager Republic Iron & Steel Co., Youngstown, Ohio. Mr. Carpenter was graduated from the University of Michigan in 1906 and before going with the Colorado company in 1916 he had been with the Cambria Steel Co., Johnstown, Pa., and the Jones & Laughlin Steel Corporation, Pittsburgh. He was assistant superintendent of the coke plants at Johnstown, and his first position with the Colorado company was superintendent of the coke works. Subsequently he became assistant to the vice-president and general manager, and in 1924 general superintendent.

H. G. O'Brien, since 1922 general manager department of special products Trumbull Steel Co., Warren, Ohio, has resigned. Previously for three years he had been general superintendent of the strip mill department of the company and was the designer of the three mills of that unit.

D. W. Wilson has been elected vice-president and general manager of the Dry Quenching Equipment Corporation, which is a subsidiary of the International Combustion Engineering Corporation, and was organized to exploit in this country the Sulzer system for the dry quenching of coke. Mr. Wilson has been intimately associated with the coke oven and gas industries. Previous identifications have been with the Wilputte Coke Oven Corporation and the Iroquois Gas Corporation. He was also assistant professor of chemical engineering at the Massachusetts Institute of Technology.

O. S. Sleeper has been appointed engineer in charge of special development work for the Buffalo Foundry & Machine Co., Buffalo. Mr. Sleeper, who is an authority on vacuum dryers and chemical plant equipment, has for the past seven years conducted the O. S. Sleeper Co., manufacturing similar equipment. Prior to that, for 15 years he was associated with the Buffalo Foundry & Machine Co. as engineer in charge of engineering.

L. G. Gorman, who has been purchasing agent of the Trumbull Steel Co., has been appointed assistant purchasing agent of the Republic Iron & Steel Co.



Dr. Fridtjof Andersen, Bremanger Kraftselskap (Bremanger Power Co.), Bergen, Norway, recently arrived in New York, and is assisting Rogers Brown & Crocker Brothers, New York, in introducing a vanadium-titanium pig iron, made by his company, to the American trade.

Howard W. Foote, chairman of the board of the North Western Expanded Steel Co., Chicago, was seriously injured, May 21, when he was hurled from the steps of a north shore electric train at Glencoe, Ill.

### Salvage Conference to Be Held in Wilmington, Del.

Representatives of large industrial corporations and public utilities have been invited to meet in Wilmington, Del., June 6 and 7, for a conference to consider problems connected with the disposal of their waste materials, obsolete equipment and surplus material. A preliminary conference was held in New York in December, and sufficient interest was shown to justify a further conference, as well as the organization of a Salvage Division, operating in connection with the National Association of Waste Material Dealers, Inc.

A dinner will be given by the Dupont company at the Dupont Hotel, and some of the speakers on that occasion will be Lamont Dupont, president Dupont Co.; Col. William C. Spruance, who will speak on "Twenty-one Years of Salvage and Reclamation Service in the Dupont Co.;" William B. Foster, director of the company's service department, who will speak on the "Benefits of Salvage and Reclamation from a Service Rendering Standpoint;" and Dr. Charles M. Stine, chemical director of the company, who will discuss "Chemistry as an Aid in the Disposition of Industrial Wastes."

### Press for Lower Freight Rate to Coast

(Concluded from page 1475)

joint rail-and-water rates and therefore should not suspend them. Secondly, the Illinois Central declared that it is not doing anything arbitrary or undertaking to give the territory from which the rates would apply an advantage, but, on the contrary, is merely undertaking to restore that territory to its place in the markets on the Pacific Coast it once held. The railroad company said it would welcome a hearing, suggesting the week beginning May 20, but said it should precede consideration by the commission of applications for suspension of the tariff. It is declared to be of the greatest significance that the protesting (Eastern) carriers have not alleged that the proposed rates would violate the act to regulate commerce and it is added that such a charge cannot be justified. The Illinois Central pointed out that the law specifically exempts from the minimum rate power of the commission joint rates where one of the carriers is a water line.

The Illinois Central petition said that it is not so much a question of comparative distances from Chicago and Pittsburgh through the Panama Canal as it is a question of placing the shippers of Chicago and the Middle West on a rate parity with their powerful competition in the United States.

"And they are entitled to at least a parity, bearing in mind that the overland short distances from Chicago are to Los Angeles, 2217 miles; San Francisco, 2260 miles, making a producer in Chicago, typical of the Middle West, 400 miles closer to the consumer in California than the Pittsburgh man, and, if there are rights constituted by difference in distances, those rights in this case accrue to Chicago and other mid-western points," said the petition.

The Bethlehem Steel Co., protesting against the tariff, contended that the present basis of charges to Chicago on business moving to Pacific ports is already more favorable than the basis accorded the Bethlehem company. The latter, it was pointed out, is subjected to charges based upon the full combination of the local rates to port of transshipment and beyond, whereas from Chicago to New Orleans the proportional rates are materially lower than the local rates contemporaneously prevailing.

## OBITUARY

L. H. COOPER, secretary Crosby Co., Buffalo, manufacturer of sheet metal stampings, died suddenly on May 14.

WILLIAM WALLACE EWING, civil engineer and most recently representative in Japan for the Jones & Laughlin Steel Corporation, Pittsburgh, died on May 17 at the home of his son, in Syracuse, N. Y. He was born at Rochester 62 years ago. After some years of experience with the New York City department of building, he spent three years in engineering work at Barcelona, Spain. Later he was special agent in South America for the bureau of foreign and domestic commerce of the United States Department of Commerce. As representative of the Jones & Laughlin company he had traveled widely in Europe and Asia and had returned from Japan only two weeks prior to his death.

FREDERIC R. C. BOYD, president Power Equipment Co., Boston, died on May 15 at the Deaconess Hospital in that city, following an operation. He was born at Hartford, Conn., and after graduating from the Massachusetts Institute of Technology in 1901 he became associated with the General Electric Co., Lynn, Mass., in the turbine department. Subsequently he was connected with the Power Equipment Co., having become president four years ago.

EDWARD C. SMITH, president and founder of the Edward C. Smith Co., Chicago, plumbing supply manufacturer, died May 15.

JOSEPH RITER, formerly associated with the Riter-Conley Co., of which his father, Thomas B. Riter, was one of the founders, died May 16 in London, where he had made his home since 1916. He was 46 years old.

CAPT. THOMAS E. CLARK, president Marine Mfg. & Supply Co., Pittsburgh, died at his home in Bellevue, Pa., May 8. In 1885 Captain Clark entered the boat building industry and a short time later established a firm of steam engine builders, which later was merged with the Pittsburgh Valve, Foundry & Construction Co. In 1901 he established the Marine Mfg. & Supply Co. For 10 years he was president of the Allegheny River Improvement Association.

### Automobile Production in April Highest, Except for March, in 20 Months

WASHINGTON, May 22.—Production of motor vehicles in the United States in April totaled 409,948, of which 364,877 were passenger cars and 45,071 were trucks. This compares with 413,379 vehicles in March, of which 371,821 were passenger cars and 41,558 were trucks, according to the Department of Commerce. The figures are based on reports from 160 manufacturers, 49 making passenger cars and 129 making trucks, 18 making both passenger cars and trucks. For the first four months of the present year production of passenger cars and trucks in the United States totaled 1,378,829 units, against 1,342,892 for the corresponding period of last year. Of the output in the current year, 1,233,425 were passenger cars, compared with 1,166,741 for the four months of 1927, and 145,404 were trucks, against 176,151 a year ago.

Except for March, the April production of passenger cars and of all vehicles was the greatest since August, 1926, when 426,606 vehicles were turned out, of which 382,651 were passenger cars. Three months in the spring of 1926—March, April and May—are the only other months since October, 1925, showing greater production than March or April, 1928.

# European Prices Still Advancing

Upward Movement Based on Higher Production Costs—British  
Secure Contracts on Foreign Construction Projects

(By Cable)

LONDON, ENGLAND, May 21.

**P**IG iron is quiet, but Cleveland makers' stocks are now less than 10,000 tons and prices are firm. Export demand for East Coast hematite is improving as prices are low and makers are desirous of clearing off surplus stocks. Foreign ore is quiet.

The steel makers' association has reaffirmed the minimum quotations on plates and shapes and export inquiry is improving, but domestic business is generally poor, especially in shipbuilding materials.

Welsh tin plate bars are officially £5 17s. 6d. (\$28.61), but some sellers are asking £6 (\$29.22) and up to £6 2s. 6d. (\$29.83) per ton is talked of because of the scarcity of scrap and the heavy demand. Tin plate is consequently strong for early delivery and the market is quite active with consumers covering steadily. Most makers are sold up to the end of August.

## British Pig Iron Active; Tin Plate Mills Well Booked

LONDON, ENGLAND, May 11.—There have been few features of interest in the British iron and steel trade during the past two weeks. Production figures for April, which have just been released, show a decline of 37,600 tons in pig iron and 149,200 tons in steel, the decrease being due mainly to the Easter holiday. At the end of April, 149 blast furnaces were operating, a net decrease of one furnace. New inquiry for pig iron has been light, with the result that the Tees shipments in April were only 8053 tons. Cleveland makers, while having practically regained the home market, are striving to reestablish themselves in Continental markets, but there is a difference of 2s. 6d. (61c.) in the prices abroad, so that Continental producers are the gainers. Buying by domestic consumers is small. There has been a tendency to refrain from buying in the belief that makers would be obliged to give way on prices, but

Galvanized sheet makers have advanced the agreed minimum price for No. 24 gage corrugated sheets 5s. (\$1.22) per ton to £13 5s. per ton (2.88c. per lb.), mainly because of higher cost Continental steel. Inquiry is reviving, especially from India, but not much actual business has been done. Black sheets are dull and prices are unchanged.

Recent rail orders have included 7000 tons for the Central Argentine Railway placed with Bolckow, Vaughan & Co. Braithwaite & Co. are to build a Calcutta, India, bridge involving 17,000 tons of steel. Sir William Arrol & Co. have been awarded the contract for the Benue River bridge in Nigeria.

Continental iron and steel prices are strong as a result of the continued upward trend of Continental costs. Foreign sheet bars have sold at £4 18s. 6d. (\$23.99) per ton, f.o.b. to Welsh consumers. Merchant bars are quoted up to £5 16s. per ton (1.28 per lb.), f.o.b. works, and good tonnages are reported to have been sold prior to the recent advance.

values are quite stable and purchasing is still of a hand-to-mouth character.

There is no improvement in the hematite market and, as stocks are large, producers are obliged to shade prices to secure orders. The slack market is due to the poor demand from foreign steel-producing countries, and East Coast makers have to compete with foreign producers on the Continent.

In semi-finished material there has been considerable strength in the market on Welsh tin plate bars, and, because of an acute shortage of heavy steel scrap, makers have been obliged to advance their quotations by 2s. 6d. (61c.) to £5 17s. 6d. (\$28.50) per gross ton, and higher prices are expected. At the same time the Continental price has been advanced, so that the margin between the two remains about the same. There has been, however, a heavy demand for Welsh sheet bars by Welsh tin plate makers, who are now experiencing a revival of activity. Foreign demand for tin plate has developed, and makers have withdrawn the

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.87 per £ as follows:

Durham coke, del'd.	£0 17½s.	\$4.27
Bilbao Rubio ore*	1 2½	5.48
Cleveland No. 1 fdy.	3 8½	16.56
Cleveland No. 3 fdy.	3 6	16.07
Cleveland No. 4 fdy.	3 5	15.83
Cleveland No. 4 forge	3 4½	15.71
Cleveland basic (nom.)	3 5	15.83
East Coast mixed...	3 9	to £3 10s. 16.81
East Coast hematite.	3 10½	17.17
Rails, 60 lb. and up.	7 15	to 8 0 37.75
Billets	6 0	to 6 10 29.22
Ferromanganese	13 15	66.97
Ferromanganese (export)	13 0	to 13 5 63.31
Sheet and tin plate bars, Welsh	5 17½	28.61
Tin plate, base box.	0 18¼	to 0 18½ 4.45
Black sheets, Japanese specifications.	13 5	64.53
Ship plates	7 12½	to 8 2½ 1.66
Boiler plates	9 2½	to 9 12½ 1.98
Tees	8 2½	to 8 12½ 1.77
Channels	7 7½	to 7 17½ 1.60
Beams	7 2½	to 7 12½ 1.55
Round bars, ¾ to 3 in.	7 5	to 7 15 1.58
Steel hoops	10 10	to 11 0 2.28
Black sheets, 24 gage	9 15	to 9 17½ 2.12
Galv. sheets, 24 gage	13 5	2.88
Cold rolled steel strip, 20 gage, nom.	14 0	to 14 5 3.04

\*Ex-ship, Tees, nominal.

## Continental Prices, All F. O. B. Channel Ports

(Per Metric Ton)			
Foundry pig iron (a):			
Belgium	£3 3s.		\$15.34
France	3 3		15.34
Luxemburg	3 3		15.34
Basic pig iron (nom.):			
Belgium	3 0	to £3 1s.	14.61 to \$14.85
France	3 0	to 3 1	14.61 to 14.85
Luxemburg	3 0	to 3 1	14.61 to 14.85
Coke	0 18		4.39
Billets:			
Belgium	4 15		23.14
France	4 15		23.14
Merchant bars:			
Belgium	5 14	to 5 16	1.26 to 1.28
France	5 14	to 5 16	1.26 to 1.28
Luxemburg	5 14	to 5 16	1.26 to 1.28
Joists (beams):			
Belgium	4 18	to 5 0	1.08 to 1.10
France	4 18	to 5 0	1.08 to 1.10
Luxemburg	4 18	to 5 0	1.08 to 1.10
Angles:			
Belgium	5 10		1.21
¾-in. plate:			
Belgium (a)	6 12		1.45
Germany (a)	6 12		1.45
½-in. ship plate:			
Belgium	6 8		1.41
Luxemburg	6 8		1.41
Sheets, heavy:			
Belgium	6 1		1.34
Germany	6 1		1.34

(a) Nominal.

restriction on output and mills are sold to normal capacity for many weeks, in some cases well toward the end of the year.

The heavy steel trade is still depressed. The makers' rebate scheme is not operating entirely satisfactorily, as merchants are dissatisfied with their treatment and are continuing more than ever to place orders on the Continent. Shipbuilders are receiving very few new orders, so that the plate mills are suffering from a lack of demand for ship steel. Domestic business in engineering and structural material contributes a fair tonnage, but export demand is negligible and plants can operate only on a part-time basis.

### Trade with Far East Curtailed by Warfare in China

NEW YORK, May 22.—Export trade with the Far East is quiet, partly as a result of the warfare in China and partly because of the recent decline in the exchange value of the Japanese yen. There has been some inquiry from Japan for tin plate, one specification calling for about 10,000 base boxes of canning sizes. The Welsh price, however, is still lower than the quotations of American mills, although exporters to Japan express the opinion that the present range of \$5.25 to \$5.30 per base box, c.i.f. Japanese port, might be shaded to about \$5.15 per base box if actual business were in sight.

Light-gage black sheets are quiet, British, German and Japanese domestic sheets being several dollars below the current offers of American mills, which are about \$77 per ton, c.i.f. Japan. Recently the Kawasaki Dockyard Co., Japan, has been quoting prices equivalent to about \$73.25 per ton, c.i.f. Japan.

Steel importers in New York report continued activity in steel hoops and bands and a moderate volume of business in structural material. Demand for bars, both plain and deformed, is rather light, and prices of the foreign product are high. Plain steel bars, following recent Continental advances, are quoted at 1.78c. to 1.80c. per lb., duty paid. Prices on foreign shapes are stronger, with the minimum at about 1.68c. per lb., duty paid, Atlantic port. There are some outstanding quotations on reinforcing bar projects, including an inquiry from the Ambursen Contracting Co., Grand Central Terminal, New York, for about 3000 tons of bars for work in Mexico.

### Steel Dwelling Construction Being Hastened in Germany

With an estimated shortage of 800,000 dwellings in Germany, the development of steel house construction in that country is being hastened, according to a statement prepared by the iron and steel division, Department of Commerce, Washington, which is based on a report from Hugh S. Fullerton, consul at Cologne. Replacement of existing structures is fixed at 200,000 dwellings annually. It is estimated that between 150,000 and 200,000 houses will be built in the Cologne district alone, which supports a population in excess of 12,000,000, and that the average dwelling will accommodate 4.6 persons.

Widespread publicity pointing out the advantages of steel houses is being engaged in by manufacturers of these structures. Some of the most effective arguments relate to the simplicity and rapidity of this method of construction, its practicability, low price, hygienic character, durability, fireproof character, conservation of space in congested municipal areas and the general layout to provide for ample gardens and backyards. The prejudice against the steel house is traditional in the Cologne area and is based principally upon aesthetic grounds. Steel house manufacturers emphasize their durability and economy, thus appealing to the poorer and middle classes. At the same time attention is being given to steel houses of more pretentious and ornate construction. Steel houses constructed by various entities of the Vereinigte Stahlwerke in plants at Duisberg, Kettwig, Wuerenburg and Bochum in the Cologne district, as well as in such cities as Munich and Berlin, range in price between \$1,428 and \$2,380.

## SWEDISH IRON AND STEEL

### Poor Conditions Have Prevailed for Some Years —Production Only Half of Maximum

WASHINGTON, May 22.—Difficulties faced by the Swedish iron and steel industry, and its trade movement since 1920, are traced in a report prepared by A. Crenshaw Thompson of the iron and steel division, Department of Commerce. It is pointed out that it was not until 1924, however, that the situation became grave, due to competition with European countries, including Germany, France and Belgium-Luxemburg, with their depreciated currencies. Efforts to reduce wages developed labor troubles in the iron ore fields and in the steel industry. In 1925 vain attempts were made by the Government to bring about a merger of seven companies, but in the succeeding year four of the principal companies were consolidated through the efforts of the Svenska Handelsbanken, a large shareholder in each of the concerns affected. On Jan. 1, 1927, the new organization began operations, with production so apportioned that each company would make its own specialties.

Pig iron output in 1913 amounted to 730,300 metric tons, or approximately 100,000 tons less than that of the peak year of 1917. A steady decline from the latter year was experienced until the low mark of 264,300 tons was reached in 1922. While production of pig iron has recovered somewhat from the 1922 level, it is still only about 55 per cent of the last pre-war year.

Steel produced during 1913 totaled 749,400 tons, the peak output. It reached its lowest point in 1921, with 236,000 tons.

Of the 121 blast furnaces in the country only 33 were operated in 1927, when production was 413,500 tons, while of the 162 Lancashire open-hearth furnaces and 81 Martin furnaces only 54 and 31 respectively were active, producing 516,200 tons of steel.

Due largely to heavy shipments of scrap in the early months, exports of iron and steel in 1927 aggregated 287,700 tons, against 242,600 tons in 1926. Imports of iron and steel in 1927 increased to 333,200 tons, compared with 299,900 tons the preceding year. Exports of iron ore showed a large increase to 10,726,000 tons in 1927, compared with an estimated movement of 9,000,000 tons in 1926. Swedish iron ore deposits are calculated at 250,000,000 metric tons of high-grade material.

### South African Railroads Use More Steel Ties

The South African Railway Administration, during the past four years, has been using steel ties in increasing quantities, according to a report received by the Department of Commerce, Washington, from the assistant trade commissioner at Johannesburg. It is stated that steel ties have been found to be more economical on light branch lines and on certain sections of the main system than wood ties. Present plans, the report says, are not to use steel ties to the exclusion of wood, but it is known that the administration favors the former whenever conditions are suited to their use. Purchases of steel ties from 1924 to 1927 were valued at £574,843, of which £414,991 worth come from Germany, £140,707 worth from France and £19,145 from Belgium.

### Polish Steel Output Increases 64 Per Cent in 1927

Reflecting an increase of 361,316 metric tons, or 64.3 per cent, production of rolling mill products in Poland last year totaled 923,383 tons, compared with 562,067 tons in 1926, according to a report received by the Department of Commerce, Washington, from the assistant trade commissioner at Warsaw. The largest production of any single commodity was in structural shapes, of which 292,568 tons were rolled in 1927 and 189,303 tons in the preceding year. Next came black sheets, of which 211,151 tons were rolled last year, compared with 153,474 tons in 1926.



# Machinery Markets and News of the Works

## MARKETS ARE QUIETER

### Sales Drop Off in Some Centers—Conditions Now Somewhat Spotty

Cincinnati Reports Only Slight Falling Off from April Rate but at Cleveland Decline Is 25 Per Cent

**S**POTTY conditions are developing in machine tool business. At Cincinnati, the volume is described as "only slightly behind that of April," but at Cleveland the decline is as much as 25 per cent in some cases. Elsewhere, business is somewhat quieter.

Several of the Detroit automobile manufacturers are figuring on small lots of tools, but generally the peak of

automobile buying for the first half of the year has been passed. Railroad buying continues disappointingly small, especially in the heavier tools. The Santa Fe has the only large list now before the trade. Some of the small tools inquired for have been bought, and orders for others are expected shortly.

Farm implement manufacturers are the principal support of trade in the Chicago district. New England looks to the development of the manufacture of airplanes and parts as an encouraging sign. In the New York district, the Wright Aeronautical Corporation is one of the most active buyers, its purchases last week including two engine lathes and other tools. The General Electric Co. has bought a few tools for service stations. Additional inquiries from this company are pending.

## New York

NEW YORK, May 22.

**T**HERE is very little new inquiry for machine tools, but some sizable business is still pending. The General Electric Co., Schenectady, has closed on a few of the tools for service stations and has additional inquiries for equipment in various plants. Further purchases of service station equipment are not planned until next month when a new appropriation is received. The Wright Aeronautical Corporation, Paterson, N. J., is still a buyer of machine tools and closed last week on several, including two engine lathes. The New York Central Railroad has inquiries out for a few small tools for the Collingwood shops at Cleveland and for shops of the Indiana Harbor Belt Railroad, Indiana Harbor, Ill.

The railroads continue inactive in purchases of tools. The list of the New York, New Haven & Hartford Railroad has not yet been closed and other railroad purchases have been decidedly small in the past week. There are two railroad shop equipment inquiries from foreign markets, however, which may develop into business sometime this year. One of these calls for a list of tools for export to Colombia and the other is for equipment of shops on the new Turkish railroads.

Plans are being arranged by Transogram Co., Inc., 215 Fourth Avenue, New York, manufacturer of toys, etc., for one-story plant at Haskell, N. J., to cost more than \$70,000 with equipment. Missac Thompson, 191 Joralemon Street, Brooklyn, is architect.

Ward Leonard Electric Co., South Street, Mount Vernon, N. Y., manufacturer of electrical resistance products, has superstructure in progress for a one-story addition, 115 x 116 ft., to cost in excess of \$85,000 with equipment.

Brislin Lumber Co., Jamaica Avenue, Brooklyn, has purchased former smelting and metallurgical works of Williams-Harvey Corporation, Mill Basin, Jamaica Bay, L. I., and will install conveying, elevating, loading and other equipment for a new storage and distributing plant.

Hugo F. Magnuson, 420 Lexington Avenue, New York, architect, has filed plans for a five-story automobile service, repair and distributing building, to cost close to \$200,000 with equipment.

Quartermaster, Mitchel Field, Long Island, is asking bids until June 6 for motor-driven deep-well pumping station, with complete auxiliary apparatus.

Associated Gas & Electric Co., 61 Broadway, New York, operating electric light and power utilities in different parts

of country, is disposing of bond issue of \$35,000,000, a portion of proceeds to be used for expansion in properties, power lines, etc.

M. Raubvogel Co., 206 East 104th Street, New York, manufacturer of bakers' equipment and fixtures, has purchased factory at 413-15 East 109th Street, 50 x 100 ft., and will remodel for new plant.

Board of Trustees, Museum of Natural History, Columbus Avenue and Seventy-seventh Street, New York, is considering new power and service station to cost more than \$500,000 with equipment. Trowbridge & Livingston, 527 Fifth Avenue, are architects.

Brooklyn Union Gas Co., 176 Remsen Street, Brooklyn, has filed plans for a one-story by-products plant, to cost close to \$500,000 with machinery.

A. J. Thomas, 2 West Forty-seventh Street, New York, architect, has plans for two-story addition to automobile service, repair and garage building to cost approximately \$100,000 with equipment.

Board of Education, Plattsburg, N. Y., plans installation of manual training equipment in new two-story high school to cost \$200,000, for which bids will soon be asked on general contract. A. Irman, 35 Clinton Street, is architect.

New York Dock Co., 44 Whitehall Street, New York, has asked bids on general contract for a multi-story factory, storage and distributing plant at 336-74 Furnam Street, Brooklyn, to cost \$2,200,000 with equipment. Russell G. Cory, 30 Church Street, New York, is architect and engineer. L. E. Driver is chief engineer for company.

Lidgerwood Mfg. Co., Lidgerwood Avenue, Elizabeth, N. J., manufacturer of hoisting machinery, etc., is reported planning early construction of one-story foundry at new plant, where production recently has been concentrated, to replace unit on Frelinghuysen Avenue, now in service for production of castings, which are being machined at Elizabeth works.

Bayway Terminal Co., Bayway, Elizabeth, N. J., operating a cotton storage and distributing plant, has filed plans for new five-story unit, 240 x 260 ft., to cost \$200,000 with equipment. George F. Bial is company architect.

J. H. Gautier Co., 1 Greene Street, Jersey City, N. J., manufacturer of crucibles, refractories, etc., will rebuild portion of plant destroyed by fire May 17, with loss reported upward of \$75,000 with equipment; boiler house was destroyed.

Western Electric Co., Kearny, N. J., has filed plans for new six-story unit, 200 x 300 ft., to cost \$1,200,000 with equipment. Executive offices are at 195 Broadway, New York.

Plant and property of Sloan & Chace, Inc., Sixth Avenue and Thirteenth Street, Newark, manufacturer of machinery and tools, will be offered at a public sale May 28 by Oliver

## The Crane Market

**I**NQUIRY for overhead traveling cranes is small, but interest in purchases of locomotive cranes continues fairly active. The Amtorg Trading Corporation, 165 Broadway, New York, has appeared again as a prospective buyer for export to Russia, with an inquiry for five electrically driven locomotive cranes, capable of lifting 11,000 lb. at 92 ft. This would require a capacity of about 65 tons each. The New York Central Railroad has revived an old inquiry for two

20-ton locomotive cranes, which are to be used at Cleveland.

Among recent purchases are:

Empire Architectural Iron Works, 530 Truxton Street, New York, 5-ton, 47-ft. 6-in. span, 3-motor, overhead crane from Northern Engineering Works.

Lorain Steel Co., Johnstown, Pa., 20-ton, 66-ft. span overhead electric traveling crane from Alliance Machine Co.

W. Hopkinson, receiver, including good will and name of company as going concern.

Art Metal Works, Inc., has been organized under State laws to take over and expand company of same name with plant at 7 Mulberry Street, Newark, manufacturer of metal goods, including toys, novelties, etc. New company plans construction of addition for which adjoining site recently was acquired. A preferred stock issue to total \$1,180,000 is being sold, portion of fund to be used for expansion.

Carrier Engineering Co., 750 Frelinghuysen Avenue, Newark, manufacturer of air-conditioning machinery and devices, has asked bids on general contract for one-story addition, to cost approximately \$70,000 with equipment. R. De Vere Hope is company architect.

Board of Education, Paterson, N. J., will soon begin work on three-story addition to vocational school on Ellison Street, 60 x 100 ft., to cost in excess of \$75,000.

Henry L. Crowley & Co., Inc., 545 North Arlington Avenue, East Orange, N. J., has been organized to manufacture synthetic ceramic products, particularly Crolite. Factory is in operation but company will be in market for additional equipment, especially machine tools similar to those used in metal works.

## Buffalo

BUFFALO, May 21.

**W**ORK is scheduled to begin soon by Great Lakes Portland Cement Co., Marine Trust Building, Buffalo, on new mill near Cleveland to cost more than \$2,000,000. Company is affiliated with Lehigh Portland Cement Co., Allentown, Pa.

Niagara, Lockport & Ontario Power Co., Buffalo General Electric Building, Buffalo, has asked bids on general contract for one-story equipment storage and distributing plant, with repair facilities, at Angola, N. Y., to cost about \$40,000.

Cheektowaga Crushed Stone Corporation, Cheektowaga, N. Y., recently organized by Mark Kyler, North Tonawanda, N. Y., and associates, has secured permission to construct and operate stone quarrying and crushing plant near Bennett and Union Roads, to cost \$100,000, of which about one-half will be expended for machinery.

Board of Education, Lackawanna, N. Y., is considering installation of manual training equipment in new two-story high school to cost \$250,000, for which plans are being drawn by Bley & Lyman, 505 Delaware Avenue, Buffalo, architects.

Gordon Motor Parts, Inc., Rochester, N. Y., recently organized by Simon Gordon, 240 Rosedale Street, and associates, with capital of \$150,000 contemplates early operation of local plant for manufacture of automobile accessories and parts. Max Gordon, 350 North Main Street, Elmira, N. Y., will be one of heads of company.

New York Power & Light Corporation, Northampton, N. Y., will construct transmission lines to Hope, Wells, Bemson and vicinity, Hamilton County, about 25 miles, and install automatic substation equipment, etc.

Pratt & Letchworth Co., 189 Tonawanda Street, Buffalo, manufacturer of iron castings, etc., is carrying out an expansion and betterment program, including installation of mechanical sand-handling equipment and other apparatus, to cost about \$45,000.

Rochester Brass & Iron Works Co., Rochester, N. Y., has sold building at 76 Exchange Street to Barr & Creelman Co., 74 Exchange Street, which will raze structure preparatory to erecting an addition. Brass & Iron Works company will remove to new location at Mount Hope and South Avenues where new building containing 20,000 sq. ft. of floor space is planned.

General Railway Signal Co., Rochester, N. Y., will distribute in United States and Canada Kuprox railroad rectifier, a device used in connection with changing of electric current from alternating to direct, which is being manufactured by Kodel Radio Corporation, Cincinnati.

## New England

BOSTON, May 21.

**A**T least two local machine tool dealers the past week did a very good business, running into several thousand dollars each. Details are withheld, but it is understood that large tools were involved. In addition, final papers were closed on the sale of two floors of used equipment at the plant of the General Shoe Machinery Co., South Boston, including radial drills, milling machines, American shapers, planers, lathes, miscellaneous metal-working tools and wood-working equipment. A Jones & Lamson turret lathe, from another source, went to a Massachusetts shop, and drilling machines, small lathes, a fairly good sized power press, shear and miller made up a representative used tool market.

None of the so-called active new tool prospects were closed, and aside from additional requisitions for equipment from the Boston & Albany Railroad, new inquiries have been scarce. This railroad has a prospective list of more than 15 tools, mostly lathes, running from 14-in. to 24-in., and drilling machines. It is reported that the company will buy one or two tools each week, until the list is completed.

Small tools are still selling freely, with a majority of orders for immediate shipment.

New England has established a footing in the aircraft industry, and machine tool interests are watching its growth as a possible outlet for metalworking equipment. Most important of new industries is Pratt & Whitney Aircraft Co., Hartford, Conn., an offspring of Pratt & Whitney Co., which began in a small way in summer of 1925. Today it has 150,000 sq. ft. of manufacturing space, and this is expected to be greatly expanded within the next year. So far it has confined itself to supplying needs of Army, Navy and Marine Corps and Canadian Air Force, but it is gradually expanding its field. At Monson, Mass., in former Rubwood Wheel, Inc., plant, under secret environment, is being manufactured an airplane of unusual construction. It is reported that this plant is turning out planes molded from various materials by means of hydraulic pressure, quite a departure from recognized standards of today. Definite specifications and other important data are expected any day. Bourdon Aircraft Co., East Greenwich Bay, Chepewanoxet, R. I., is producing planes. In several other New England localities companies are working either on airplane engines or superstructure, and as trend of superstructure is toward all metal, involving welding and other methods of construction, it is felt that New England has a potential undeveloped machine tool field.

Western Electric Co., West Haven, Conn., will erect plant for manufacturing and storage, to cost, without equipment, \$100,000.

International Silver Co., Meriden, Conn., has acquired E. G. Webster & Sons, Inc., Brooklyn, and will remove business to Meriden. Parent company has under consideration purchase of new equipment, especially presses.

Alden Mfg. Co., Springfield, Mass., radio products, has leased manufacturing quarters on Plain Street, Brockton, Mass. Installation of equipment will start this week, and production will begin about July 1.

The Barker Steel Co., Boston, reinforcing steel, has moved from 19 Congress Street to 250 Stuart Street, room 310.

Plans have been filed by Koppers Co., New Haven, Conn., for one-story machine shop, 82 x 110 ft.; power substation, 35 x 70 ft., and booster shop, 31 x 42 ft., at its new gas and coke plant now in course of building. New structures will cost about \$100,000 with equipment. Company is said to be concluding arrangements for purchase of substantial interest in Massachusetts Gas Companies, Inc., Boston, to

be followed by construction of a second gas and by-products coke plant, to cost more than \$4,000,000. Headquarters of Koppers Co. are in Union Trust Building, Pittsburgh.

Stone & Forsyth Co., 67 Kingston Street, Boston, paper products, has awarded general contract to Blake & Pope Co., 38 Chauncy Street, for a two-story addition to cost close to \$50,000 with equipment.

Bullard Machine Tool Co., Bridgeport, Conn., has awarded general contract to Hewlett Co., 886 Main Street, for a two-story foundry addition, 100 x 200 ft., to cost in excess of \$85,000 with equipment. Fletcher-Thompson, Inc., 542 Fairfield Avenue, is architect and engineer.

Consolidated Lamp Co., Danvers, Mass., manufacturer of electric lamps, radio tubes, etc., has acquired factory of Albert M. Creighton Shoe Co., Lynn, Mass., and will remove present works to new location. Additional equipment will be installed.

Camire & Gauthier Welding & Machine Co., Lawrence, Mass., has leased old Boston & Lowell depot property, and will operate a new works at that location, including machine and parts, and welding divisions.

Ames Shovel & Tool Co., Seavey Street, Westbrook, Me., is considering rebuilding portion of plant destroyed by fire May 12, with loss reported close to \$45,000 including equipment. Headquarters are in Ames Building, Boston.

Uppercu-Cadillac Co., 532 Fairfield Avenue, Bridgeport, Conn., representative for Cadillac automobiles, has filed plans for one- and two-story service, repair and garage building, 100 x 250 ft., to cost upward of \$160,000 with equipment.

State Board of Education, Hartford, Conn., has awarded general contract to Wise & Upson, Inc., 7 Forest Street, for three-story State trade school at 10 Washington Street, and foundations will soon be laid. Equipment will be secured later, including machine shop, wood-working and carpenter shop, plumbing and electrical shops, automobile shop and other mechanical departments. Carl J. Malmfeldt and T. Merrill Prentice, Hartford, are associated architects.

## St. Louis

ST. LOUIS, May 21.

PROPERTY near Leeds, Mo., has been acquired by Chevrolet Motor Co., Detroit, for new assembling plant, comprising three main units, one-story, 462 x 480 ft.; one-story, 161 x 200 ft.; and three-story, 43 x 208 ft., to cost more than \$1,000,000 with equipment. Albert Kahn, Marquette Building, Detroit, is architect.

Harrison Smith Co., 711 North Broadway, Oklahoma City, Okla., manufacturer of automobile accessories, has awarded general contract to Charles E. Huffman & Son, 224 West Twenty-third Street, for new two-story plant, 140 x 150 ft., to cost about \$80,000 with equipment. Harry Reynolds, 915 North Hudson Street, is architect.

Poter Oil Refining Co., 1434 Whittenberg Avenue, St. Louis, is considering new oil storage and distributing plant, to cost in excess of \$45,000 with equipment.

Southern Malleable Iron Co., Twenty-first and Bond Street, East St. Louis, Ill., has awarded general contract to St. Louis Structural Steel Co., Amherst Street, East St. Louis, for one-story foundry addition, 85 x 280 ft., to cost \$40,000 with equipment.

Oklahoma Gas & Electric Co., Oklahoma City, Okla., has acquired municipal electric light and power plant at Elmore City, Okla., and plans expansion in that section, including transmission lines. Company has acquired municipal property at Calera, Okla., and will make similar extensions.

Leland I. Shumway, Alexander Building, Tulsa, Okla., architect, has completed plans for six-story and basement automobile service, repair and garage building, 100 x 140 ft., to cost close to \$100,000 with equipment.

Imperial Casket Co., 1415 St. Louis Avenue, Kansas City, Mo., has asked bids on revised plans for two-story plant to cost close to \$45,000 with equipment. W. J. Kosh, Mutual Building, is architect.

E. R. Porter, Brandeis Theater Building, Omaha, Neb., and associates will soon have plans drawn for three-story automobile service, repair and garage building, to cost about \$160,000 with equipment.

Burlington Ice, Refrigeration & Express Co., Omaha, Neb., is planning early rebuilding of ice-manufacturing and cold storage plant destroyed by fire May 8, with loss reported in excess of \$40,000 with equipment.

Laclede Power & Light Co., Eleventh and Locust Streets, St. Louis, has plans for a two-story power switching station, 20 x 145 ft., to cost about \$45,000 with equipment.

Independent Plumbing & Heating Co., 1119 Chestnut Street, St. Louis, has awarded general contract to McCormack-Combs Construction Co., Columbia Building, for one and two-story storage and distributing plant, with pipe fitting and repair department, 110 x 281 ft., to cost about

\$125,000 with equipment. D. R. Harrison, Ambassador Building, is architect.

City Council, Campbell, Mo., is asking bids until June 5, for one-story municipal electric light and power plant, to cost approximately \$40,000 with equipment. A. C. Moore, Joplin National Bank Building, Joplin, Mo., is consulting engineer.

## Chicago

CHICAGO, May 21.

SALES the past week were widely scattered and usually in small lots. From the viewpoint of inquiries, the railroads are in need of little machine tool equipment. The Santa Fe has the only large list before the trade and it is moving very slowly, although there is some promise of more activity soon. The Chicago & North Western will buy an 18-in. x 2½-in. double-wheel grinder. Among industrials, farm implement manufacturers are the most active, the outstanding business before the trade being the list in preparation by Deere & Co. A plating equipment maker has ordered a 14-in. x 6-ft. lathe, and a tool and die shop has purchased a 3-ft. radial drill. Dealers are having little trouble in disposing of used tools in good condition.

Huguelet Brothers, 911 Ernst Court, Chicago, will build a four-story garage, 50 x 200 ft., to cost \$150,000.

Northwestern Barb Wire Co., Sterling, Ill., suffered a \$300,000 loss by fire on May 18.

Minnesota Steel Co., Duluth, is enlarging its steel fence post department 40 per cent.

Contract has been let by Link-Belt Co., 329 West Thirty-ninth Street, Chicago, to P. M. Tilley, Inc., 844 Rush Street, for one-story plant unit, 120 x 220 ft., to cost about \$60,000 exclusive of equipment. H. Jacoby, 329 Pershing Road, is architect.

Duro Metal Products Co., 2649 North Kildare Street, Chicago, has awarded general contract to Austin Co. for one-story addition, to cost \$50,000 with equipment.

American Gas & Power Co., Minneapolis, Minn., operating Minneapolis Gas Light Co. and other electric light and power properties, is disposing of bond issue of \$6,500,000, a portion of proceeds to be used for expansion and acquisition of properties, transmission lines, etc.

City Council, Willmar, Minn., is asking bids until May 28 for equipment for municipal electric light and power plant, including one 1000-kw. engine generator and turbine generator set, one surface condenser, one cooling tower, with complete accessories. Pillsbury Engineering Co., 2344 Nicollet Avenue, Minneapolis, Minn., is engineer.

Dominion Electric Co., 116 First Avenue, North, Minneapolis, Minn., manufacturer of electrical equipment and supplies, is reported planning two new units to cost close to \$100,000 with equipment.

Hudson Mfg. Co., 324 Third Avenue, North, Minneapolis, Minn., manufacturer of pumping equipment for farms, barn equipment, etc., is said to be considering construction of new plant at Waukesha, Wis.

Cooper Mfg. Co., Marshalltown, Iowa, manufacturer of automobile parts and equipment is contemplating construction of one-story branch plant at Cedar Rapids, Iowa, to cost approximately \$50,000 with equipment.

Dry Zero Corporation, 130 North Wells Street, Chicago, R. S. Phillips, head, manufacturer of dry ice under special process, is said to be planning a new plant to cost in excess of \$60,000 with equipment.

Super Maid Corporation, Chicago, has been organized to take over and consolidate Super Maid Cook-Ware Corporation, 2742 West Thirty-sixth Place, and Advance Pattern & Foundry Co., with plant on adjoining site, manufacturer of aluminum cooking ware products. Work is in progress on a new unit of 65,000 sq. ft. floor space, providing a total of 120,000 sq. ft. in two plants. New company will dispose of stock issue to approximate \$1,925,000, a considerable portion of fund to be used for expansion.

Common Council, Sleepy Eye, Minn., is asking bids until June 5 for new stoker suitable for 305-hp. boiler unit, now installed in municipal power station, with complete accessories. Charles Baugatz is superintendent of electric light and water works.

Ovens, power equipment, conveying and other machinery will be installed in new two and four-story plant to be built by Zinsmaster Baking Co., Sherburne and Park Streets, St. Paul, Minn., at Minneapolis, Minn., to cost \$180,000. Charles W. DeJarnett, Hubbell Building, Des Moines, Iowa, is architect.



Union Furnace Co., Columbus, Ohio, has purchased Marshalltown Heater Co., Marshalltown, Iowa, and will continue manufacture of furnaces. Transaction will not affect Marshalltown Mfg. Co., which has been operated by same interests and which is now beginning expansion program to double plant production.

Blackhawk Foundry & Machine Co., Clark Street and Telegraph Road, Davenport, Iowa, manufacturer of aluminum and gray iron castings, has let contract for foundry, 42 x 90 ft., adjoining its present group of buildings. It will contain equipment for mixing, handling and conditioning sand for molding.

Rockford Metal Specialty Co., 700 Cedar Street, Rockford, Ill., manufacturer of metal stampings, has let contract for a two-story factory, 50 x 100 ft., to cost \$100,000. It will be constructed to carry two additional floors. Company expects to occupy new building in about three months and will abandon old plant at 616 Cedar Street.

H. K. Porter Co., Pittsburgh, has removed its Chicago office from 447 Monadnock Building to Engineering Building at Wells Street and Wacker Drive. George Kirtley is district manager.

Manganese Steel Forge Co., Philadelphia, maker of manganese steel products, has removed its Chicago office from Old Colony Building to Builders Building, LaSalle Street and Wacker Drive. W. H. Potter is in charge.

## Philadelphia

PHILADELPHIA, May 21.

PERMIT has been taken out by Philadelphia Rapid Transit Co., Broad and Locust Streets, Philadelphia, for a one-story repair shop to cost \$115,000 with equipment.

Williams Brothers, Inc., 3078 Helen Street, Philadelphia, automotive engineer, has asked bids on general contract for one-story shop, 36 x 100 ft. Benjamin Shulman, 1722 Arch Street, is architect.

Cohn Brothers, 137 South Eleventh Street, Philadelphia, manufacturer of metal specialties, has leased three-story building at 1225 Race Street and will occupy for new plant.

Machinery and equipment of Eagle Charger Corporation, 121 North Eighth Street, Philadelphia, bankrupt, will be offered at public sale May 28, by Abraham Goldman, receiver.

Department of Wharves, Docks and Ferries, Municipal Pier No. 4, foot of Kenilworth Street, Philadelphia, Richard Weglein, director, will receive bids until May 28 for steel rolling doors for Cherry Street Pier No. 9, North Delaware Wharves, schedule D.

I. W. Levin, 1011 Chestnut Street, Philadelphia, architect, has asked bids on general contract for two-story automobile service, repair and garage building, 100 x 110 ft., to cost about \$90,000 with equipment.

Niles-Bement-Pond Co., Meadow and Mifflin Streets, Philadelphia, Niles crane division, has filed plans for a one-story addition to cost about \$19,000 with equipment.

Norman B. Mathieu, Philadelphia, has purchased three-story factory at 96 Collom Street, with L-extension, and will remodel for a woodworking plant.

Atlantic City Electric Co., Atlantic City, N. J., is negotiating for purchase of municipal electric light and power plant at Beach Haven and plans expansion, including transmission line construction.

Board of Education, Camden County Vocational School, Pensauken Township, N. J., has plans for two one-story additions to institution, 36 x 51 ft. and 25 x 26 ft. Lackey & Hettel, 5 Hudson Avenue, Camden, N. J., are architects.

Borough Council, West Chester, Pa., will receive bids until June 13 for equipment for pumping station and filtration plant for municipal waterworks, including motor-driven centrifugal pumps, electrical equipment, switchboard, filter equipment, etc., and one 3,000,000-gal. capacity steel reservoir piping and accessories. Remington & Vosbury, 509 Cooper Street, Camden, N. J., are engineers.

Board of School Control, Scranton, Pa., will take bids in about a month for four-story technical high school, with manual training division, to cost about \$500,000 with equipment. A. J. Ward, Scranton-Lackawanna Office Building, Scranton, is architect.

Delaware Electric & Supply Co., Shipley Street, Wilmington, Del., is carrying out an expansion and improvement program, including new two-story equipment storage and distributing plant, pipe fitting and cutting shop, 90 x 90 ft.

City Garage, 718 Main Street, Towanda, Pa., operated by J. R. Overton and W. Smith, will take bids soon on general contract for new two-story service, repair and garage building, to cost in excess of \$80,000 with equipment. H. C. Child, 501 South Keystone Avenue, Sayre, Pa., is architect.

Danville Structural Steel Co., Danville, Pa., has begun foundations for one-story addition to No. 2 plant, 95 x 250 ft., to develop tube mill to total length of 600 ft. Plant

No. 1 is being rebuilt and additional equipment will be installed for increased output in brake beam division. Entire project will cost more than \$300,000 with equipment.

## South Atlantic States

BALTIMORE, May 21.

PLANS are being arranged by Bowker Chemical Co., First Street and Tenth Avenue, Baltimore, for rebuilding fertilizer manufacturing plant recently partially destroyed by fire, to cost upward of \$45,000 with equipment. Engineering department, American Agricultural Chemical Co., 419 Fourth Avenue, New York, in charge.

Carolina Cement Co., New Bern, N. C., recently formed by J. A. Acker, Port Huron, Mich., identified with New Egyptian Portland Cement Co., has plans nearing completion for local mill on property acquired about five months ago, to consist of main kiln unit, 110 x 500 ft.; one-story grinding mill, 100 x 460 ft.; one-story machine shop, 50 x 155 ft.; storage and distributing plant, 180 x 550 ft.; power house with capacity of 5000 kva., and other structures, for output of about 4000 bbl. per day, to cost close to \$2,000,000 with equipment. Samuel E. Flexner is consulting engineer.

Chemical Warfare Service, Edgewood Arsenal, Md., is asking bids until May 31 for taps, dies, reamers, cutters, mandrels, emery wheels, drills, etc., circular 109.

Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, will take over plant and property of Northern Maryland Power Co. at Havre de Grace, Md., and vicinity, and plans expansion including transmission line construction.

Mount Airy Canning Co., Mountain Lake Park, Md., has plans for an addition to power house, to include installation of two 50-hp. boiler units, engine and auxiliary equipment.

Julian Friez & Son, Baltimore and Central Avenues, Baltimore, manufacturer of scientific instruments, etc., plan early call for bids for two-story addition, 67 x 85 ft., to cost approximately \$75,000 with equipment. E. H. Glidden, Jr., American Building, is architect.

Georgia Power Co., Atlanta, Ga., has acquired municipal power plant at Winder, Ga., for \$300,000 and plans expansion, including installation of additional equipment and construction of transmission lines.

Burwell-Harris Motor Co., 229 North Tryon Street, Charlotte, N. C., is completing plans for four-story addition to service, repair and garage building, totaling about 32,000 sq. ft. floor space, to cost in excess of \$100,000 with equipment. Lockwood, Greene & Co., Charlotte, are architects and engineers.

Lindsay-McMillan Co., 93 South Water Street, Milwaukee, manufacturer of refined oils, has begun work on new branch plant at Savannah, Ga., where 5-acre tract was recently secured, for production of heavy oils from rosin under special process. It is reported to cost about \$60,000 with equipment. Other units are contemplated later.

Virginia Electric & Power Co., Richmond, Va., plans expansion in vicinity of Quantico, Va., including construction of power transmission line from that place to Occoquan, to cost \$150,000. Robert Throckmorton is manager of light and power division.

Board of Education, District of Columbia, District Building, Washington, is said to be planning installation of manual training equipment in new two-story junior high school in Brightwood district to cost close to \$500,000, for which bids will be asked on general contract early in June. A. L. Harris, District Building, is architect.

General purchasing officer, Panama Canal, Washington, will receive bids until May 29, for 60 metal-cutting band saws, boiler punch dies, 200 chain shackles, six double-acting pumps, eye bolts and other equipment, Panama schedule 2458; until June 7 for gasoline section cars, split pulleys, wire cloth, gate valves, blower, tie plates, etc., Panama schedule 1878.

National Garages, Inc., 1432 Buhl Street, Detroit, has awarded general contract to Carr Construction Co., Candler Building, Atlanta, Ga., for five-story service, repair and garage building at Atlanta, 90 x 133 ft., to cost approximately \$275,000 with equipment.

Board of Education, Atlanta, Ga., will receive bids until June 15 for mechanical and other equipment for all school buildings now authorized, to cost about \$150,000, including addition to commercial high school, for which bids are being received on general contract until May 28. R. R. Ritchie is assistant superintendent.

Sterling Motor Truck Co., West Allis, Wis., has completed plans for a merger with Corbitt Truck Co., Henderson, N. C., and will carry out an expansion program. Both plants will be continued in service with provision for parts for Sterling trucks at Henderson works.

Semmes Motor Co., 613 G Street, Washington, has plans for four-story service, repair and garage building to cost about \$200,000. George N. Ray, 1219 Connecticut Avenue, is architect.

## Pittsburgh

PITTSBURGH, May 21.

**M**ACHINE tool business still is disappointingly light. Inquiries create hopes that only infrequently are realized, and with most firms this month will probably be as lean in sales as April. A good many steel plant improvements are under way or in prospect, but they are not developing many machine tool inquiries, the call being chiefly for cranes and other heavy equipment.

In connection with proposed rayon mill at Meadville, Pa., Viscose Co. of America, Inc., Marcus Hook, Pa., plans purchase of pumping machinery, hydraulic filter presses, cast iron vessels, tin-lined steel vessels, bronze valve and fittings and other equipment. Information at purchasing department, Marcus Hook.

Fairbanks, Morse & Co., Law and Finance Building, Pittsburgh, are completing a new factory branch at Fortieth and Butler Streets, comprising repair works, storage and distributing departments. Headquarters are at 900 South Wabash Avenue, Chicago. R. J. Ray is district manager.

McKinney Mfg. Co., Metropolitan and Liverpool Streets, Pittsburgh, manufacturer of shelf hardware, builders' hardware, etc., has disposed of a stock issue to total \$390,000, portion of proceeds to be used for expansion. Facilities will be provided for production of new line of hardware specialties.

Morrison, Gross & Co., Elkins, W. Va., operating a hardwood mill, are planning purchase of narrow gage industrial locomotive, 20 to 24 tons capacity.

Erie Railroad Co., Meadville, Pa., will make improvements in local west yards, including installation of ash-handling system, to cost close to \$100,000. Engineering department, 50 Church Street, New York, in charge.

Baltimore & Ohio Railroad Co., B. & O. Building, Baltimore, has plans for rebuilding engine house and repair department at Connellsville, Pa., recently damaged by fire. H. A. Lane is chief engineer.

Norman Allderice, 5727 Wilkins Avenue, Pittsburgh, and associates have organized Chromium Co. of Pittsburgh, Inc., and plan operation of local factory for manufacture of metal-plated goods. Mr. Allderice will be treasurer; Edward C. McHugh, 747 Union Trust Building, is also interested in company.

Joseph Greenspon's Sons Iron & Steel Co., 3130 Hall Street, St. Louis, has taken title to plant of Sharon Pressed Steel Co., Sharon, Pa., idle for about four years, and will remodel for branch works for production of oil and gas well pipe.

## Cleveland

CLEVELAND, May 21.

**M**ACHINE tool business and inquiry is rather light. Orders with some manufacturers so far this month show a falling off of 25 per cent as compared with the corresponding period in April. An Ohio manufacturer outside of the automotive industry purchased five machines the past week and has a few more tools to place. Several Detroit automobile manufacturers are figuring on small lots of tools. In the Cleveland territory the market is dull with only a few scattering sales of single machines.

Contract has been let by United States Air Compressor Co., 5300 Harvard Avenue, Cleveland, to J. L. Hunting Co., Guarantee Title Building, for one-story addition, 140 x 150 ft., to cost approximately \$65,000 with equipment. G. S. Rider Co., Century Building, is architect and engineer.

Eaton Axle & Spring Co., East 140th Street and New York Central Railroad, Cleveland, has leased a building at Bridgeport, Conn., for a new branch plant exclusively for manufacture of automobile bumpers, for which company has secured a contract totaling more than \$1,200,000.

Board of Directors, Young Men's Christian Association, Central Branch, Cleveland, Robert Lewis, secretary, has plans for a four-story technical and vocational school, 50 x 120 ft., to cost \$200,000. Hubbell & Benes, 4500 Euclid Avenue, are architects.

Ohio Public Service Co., Lorain, Ohio, will carry out an expansion and improvement program at local Edgewater generating plant, including installation of new generating equipment and auxiliary machinery to cost close to \$450,000. Work has been started on new power substation. Executive offices are in Hanna Building, Cleveland. Plans are nearing completion for one-story equipment storage and distributing plant, with repair facilities, at Elyria, Ohio, to cost approximately \$80,000 with equipment. R. S. Silsbee, Elyria Savings & Trust Building, is architect for latter structure.

J. F. Steffens, Fidelity Mortgage Building, Cleveland, architect, has revised plans for two-story automobile service, repair and garage building, to cost in excess of \$100,000 with equipment.

Electric Public Utilities Co., Findlay, Ohio, operating electric light and power and railroad properties, is disposing of a note issue of \$3,000,000, a portion of proceeds to be used for expansion and improvements, including transmission line construction.

J. T. Seaver, Inc., Fairmount Cedar Building, Cleveland, has been appointed representative in that district for American Hoist & Derrick Co., St. Paul, Minn.

Steel Improvement & Forge Co., Cleveland, recently at 5003 Windsor Avenue, has completed new shop on Addison Road which it will occupy shortly. Company manufactures drop forgings and does general jobbing business. Considerable new equipment has been purchased.

## Gulf States

BIRMINGHAM, May 21.

**P**LANs are being arranged by Valley Bonded Warehouse Co., Brownsville, Tex., for a two-story cold storage and refrigerating plant, 100 x 235 ft., to cost about \$250,000 with equipment. J. A. Taylor, 2302 Indiana Street, Houston, Tex., is engineer.

Sweetwater Refining Co., Sweetwater, Tex., has been acquired by new interests, headed by J. A. Johnson, Tulsa, Okla., which will reorganize company and operate under name of Sweetwater Oil & Refining Co. Plans are under way for extensions and improvements in local refinery to more than double present capacity, to cost upward of \$80,000 with machinery.

Saxet Co., Houston, Tex., operating Saxet Gas Co., with natural gas properties in south central section of State, and Saxet Sand & Gravel Co., operating plants in same district, is disposing of bond issue of \$1,850,000, a portion of proceeds to be used for expansion and installation of additional equipment.

Continental Wirebound Box Co., 1909 Campbell Street, Houston, Tex., has purchased plant and business of Republic Box Co., 4100 Leeland Avenue, and will consolidate with organization. Plans are being arranged for expansion.

Alabama Power Co., Birmingham, has begun excavations for new steam-operated electric power plant on Warrior River, near Gorgas, Ala., with initial capacity of 80,000 hp. It is proposed to have station ready for service early next year. Provisions will be made for later installation of three additional generating units of same size. Extensions will be made in transmission lines. Entire project will cost more than \$15,000,000.

Burford Oil Co., Shreveport, La., recently formed by F. W. Burford, vice-president and general manager Crystal Oil Refining Corporation, Shreveport, and associates, with capital of 200,000 shares of stock, no par value, has acquired property at Pecos, Tex., and plans early construction of new oil refinery with capacity for handling about 5000 bbl. crude oil per day; department will be installed for refining of gasoline. A pipe line will be constructed from Hendricks field, Winkler County, to new refining unit. Entire project will cost in excess of \$600,000.

United States Hammered Piston Ring Co., 611 First Avenue, St. Petersburg, Fla., W. T. Baynard, manager, is having plans prepared for new one-story factory to cost close to \$50,000 with machinery. Edgar Ferdon, Sumner Building, is architect.

Clarence W. King, Giddens-Lane Building, Shreveport, La., architect, will take bids on general contract early in June for four-story automobile service, repair and garage building, to cost close to \$100,000 with equipment. Same architect also has plans for three-story and basement garage unit, 115 x 150 ft., to cost approximately \$95,000 with equipment.

Following recent sale of note issue for \$2,500,000, Texas Cities Gas Co., El Paso, Tex., operating natural and artificial gas properties, is arranging for additional financing and will dispose of bonds in amount of \$5,400,000, a considerable portion of fund to be used for expansion and betterments in plants and systems.

Common Council, Mangham, La., is asking bids until May 31 for equipment for municipal waterworks, including pumping machinery and accessories and elevated tank and tower. F. P. Joseph, Glenmora, La., is consulting engineer.

Swift & Co., Union Stock Yards, Chicago, has awarded general contract to R. S. Gillespie, 111 West Ashley Street, Jacksonville, Fla., for multi-story lard and vegetable oil refinery at Jacksonville, 100 x 200 ft., to cost approximately \$240,000 with machinery.

State Building Commission, Jackson, Miss., O. J. Turner, Belzoni, Miss., member in charge of budget, is arranging fund of \$225,000 for construction of new power plant, ice-manufacturing and cold storage plant at East Mississippi Hospital for Insane; and fund of \$225,000 for new structures at Alcorn Agricultural and Mechanical College, including mechanical trades building.

Mississippi Power Co., Gulfport, Miss., is planning extensions and improvements in vicinity of Richton and Hattiesburg, Miss., including construction of about 44 miles new power transmission lines, installation of automatic substation equipment, etc., to cost upward of \$80,000.

Town Council, Wiggins, Miss., is asking bids until May 29 for equipment for municipal waterworks, including motor-driven centrifugal pumping unit and accessories; elevated tank on 100 ft. tower, 100,000-gal. capacity, etc. Morgan & Co., Edwards Building, Jackson, Miss., are engineers.

## Cincinnati

CINCINNATI, May 21.

SALES held up fairly well the past week, and the amount of business placed with local machine tool builders is running only slightly behind that in April. The market is somewhat spotty, however, with some manufacturers reporting a moderate volume of orders and others stating that activities are quiet. A pick-up in sales of heavy tools is a development worthy of note. The Santa Fe, which recently purchased some of the small machines on its list, is now closing for large equipment on which bids were taken several weeks ago. The Southern Pacific has bought a 30-in. x 14-ft. heavy-duty engine lathe, while the Department of City Transit, Philadelphia, has contracted for a No. 2 carwheel lathe, a 48-in. carwheel borer and a combination journal turning and axle lathe.

Metal Aircraft Corporation, Cincinnati, recently incorporated, will begin construction of a one-story building containing 35,000 sq. ft. for manufacture of an all-metal monoplane. Thomas E. Halpin is third vice-president and general manager.

Contract has been let by National Broach Co., Third and June Streets, Dayton, Ohio, to J. C. Gohn, Dayton, for one-story addition to cost approximately \$27,000 with equipment. Oscar M. Pook is president.

Hedges, Walsh & Weidner Co., Chattanooga, Tenn., has been organized to take over and consolidate Walsh & Weidner Boiler Co., West Main and Sycamore Streets, and Casey-Hedges Co., Chestnut and Twenty-sixth Streets, manufacturer of boilers, tanks and other plate products. Present plants will be continued in operation, and plans are being arranged for expansion in production. M. M. Hedges will be president of consolidated company.

City Council, Paducah, Ky., is considering installation of a municipal electric light and power plant, to cost in excess of \$75,000 with equipment. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is engineer.

Board of Education, Mount Healthy, Ohio, is considering installation of manual training department in new two-story high school to cost close to \$170,000, for which bids have been asked on general contract. Samuel Hannaford & Sons, Dixie Terminal Building, Cincinnati, are architects.

An industrial committee at Columbia, Tenn., headed by Dr. J. B. Hardison, chairman, is in negotiation with a company, name temporarily withheld, for establishment of local foundry for production of stove castings. Initial unit, to be provided by city, will be one-story, 70 x 320 ft., with adjoining site for expansion.

Henry Fischer Packing Co., 1860 Mellwood Avenue, Louisville, will erect one-story and basement cold storage and refrigerating plant, 70 x 93 ft., to cost approximately \$50,000 with equipment.

Schuler Axle Co., N and Jones Streets, Louisville, is planning for one-story addition to cost close to \$20,000 with equipment.

Dayton Power & Light Co., Dayton, Ohio, is completing plans for new auxiliary steam-operated electric power plant,

to cost in excess of \$300,000 with equipment. Extensions will be made in transmission lines.

Emery Candle Co., Cincinnati, has changed its name to Emery Industries, Inc.

## Indiana

INDIANAPOLIS, May 21.

PLANS are being drawn by Cleveland, Cincinnati, Chicago & St. Louis Railroad Co., Cincinnati, for new engine house and shops at Beach Grove, Ind., to cost more than \$200,000 with equipment.

Board of School Trustees, Sheridan, contemplates installation of manual training equipment in two-story and basement high and grade school to cost \$250,000, for which bids will be asked on general contract in July. McGuire & Shook, 941 North Meridian Street, Indianapolis, are architects.

Central Indiana Power Co., 2 West Washington Street, Indianapolis, is disposing of note issue of \$3,000,000, a portion of proceeds to be used for expansion, including transmission line construction. Company is affiliated with Middle West Utilities Co., 72 West Adams Street, Chicago.

Enos Coal & Mining Co., Oakland City, has plans for one and two-story equipment storage and distributing plant, with repair facilities, to cost approximately \$50,000 with equipment. H. D. Boyle, Furniture Building, Evansville, Ind., is architect.

Board of Trustees, Edinburg, is asking bids until June 4 for a municipal electric light and power plant. Donald Graham, Hume-Mansur Building, Indianapolis, is architect. Roy Porter is city clerk.

Delco-Remy Corporation, Anderson, manufacturer of automobile starting and lighting equipment, division of General Motors Corporation, is completing plans for one-story addition to plant on Noble Street, 250 x 270 ft., to cost upward of \$100,000 with equipment. Portion of structure will be equipped as foundry.

Indiana Electric Corporation, Indianapolis, has arranged for a bond issue of \$3,268,000, portion of proceeds to be used for expansion in power facilities and transmission lines.

Hoosier Gas & Light Co., Greensburg, is completing arrangements for purchase of natural gas properties and systems in this vicinity, including Zoller Gas Co., Muddy Fork Gas Co., Citizens' Gas Supply Co., and Hoosier Public Utilities Co. Permission has been asked to dispose of bond issue of \$500,000, and stock issue of 10,000 shares, no par value, proceeds to be used in part for acquisition of properties and extensions in facilities, pipe lines, etc.

Shadberg Co., 4048 North Pennsylvania Avenue, Indianapolis, has been organized to take over patents on shallow well water pumps, line shaft clutches and rights on certain automobile brake inventions. Company will probably grant rights for manufacturing these products to other companies.

## Milwaukee

MILWAUKEE, May 21.

ORDERS for machine tools are being maintained

at a fairly even rate, and judging by inquiry, prospects are for a continuance of moderate activity. There has been an improvement in opinion concerning the future, due largely to the fact that business has held up considerably better than had been expected. Few users are undertaking or contemplating plant expansion, but there is more than the usual effort to make replacements to keep shops at the highest efficiency. Business is coming from widely diversified sources, and the aggregate of orders is relatively satisfactory.

City Commission, Kenosha, Wis., is asking for bids until June 1 for construction of a municipal filtration plant designed by Alvord, Burdick & Howson, consulting engineers, Chicago, and estimated to cost \$95,000. Proposals are solicited on any or all of these contracts: (a) Filter plant structures; (b) filtration equipment, 6,000,000 gal.; (c) steel wash water tank, 100,000 gal. C. M. Osborn is city manager, and P. J. Hurtgen, director of public works.

Wisconsin Power & Light Co., 16 North Carroll Street, Madison, Wis., has accepted bid of J. H. Findorff & Son, local, for general contract to erect a ten-story headquarters building, including motor bus terminal, garage and maintenance plant. The total cost will approximate \$500,000. E. J. Kallevang is chief engineer. Architects are Law, Law & Potter, Madison.

Racine Electric Co., Bridge and Ontario Streets, Racine, Wis., manufacturer of fractional horse-power motors for



household and industrial appliances, has changed its name to Racine Universal Motor Co., and increased its capitalization from \$75,000 to \$120,000. Enlargement of plant and production is contemplated, but details have not been divulged.

Wisconsin Knife Works, Clinton, Wis., manufacturer of high-speed steel knives, carbon steel cutters, molding blanks, etc., has been taken over by a group of Beloit, Wis., capital and will build a new plant in Beloit, 40 x 250 ft., part two stories and basement, costing about \$50,000. Construction contracts have just been awarded. P. G. Farrow, 902 Wisconsin Avenue, Beloit, is president and general manager.

Tobin Tool & Die Co., 220 Ruggles Street, Fond du Lac, Wis., has broken ground for a one-story addition, 50 x 75 ft., designed by Frank J. Stepnoski, local architect. An investment of about \$20,000 in building and equipment is contemplated.

Badger Metal Products Co., Milwaukee, has been organized with \$20,000 capital stock to manufacture metal and wood products, forms, dies, etc. The principals are Russell W. and John K. Stambaugh, 683 Fiftieth Street, and W. E. Browne. Plans for manufacturing will be made public shortly.

Loeffelholz Co., 170 Clinton Street, manufacturer of brass castings, has started work on erection of a shop extension costing about \$25,000.

Eastman Mfg. Co., 1002 North Eleventh Street, Manitowoc, Wis., manufacturer of hose couplings, is building a \$20,000 manufacturing addition.

George H. Smith Steel Casting Co., 500 Clinton Street, Milwaukee, has increased its capitalization from \$450,000 to \$810,000, to accommodate growth of business. Some new construction is contemplated, but details are not yet ready.

Hudson Mfg. Co., Minneapolis, Minn., steel barn equipment, farm pumps, vents, hay loaders, etc., is negotiating with Association of Commerce of Waukesha, Wis., with a view of building a new plant in which its operations will be consolidated. It now maintains factories in Minneapolis and at Oshkosh and DePere, Wis. Annual output is valued at \$2,000,000.

## Detroit

DETROIT, May 21.

**A**N expansion program is being arranged by O. L. Anderson Co., Inc., 1347 East Fort Street, Detroit, manufacturer of sheet metal parts for automobiles, including gasoline tanks and fenders, to include installation of additional equipment, to cost more than \$35,000.

Wilder-Strong Implement Co., First Street and Kentucky Avenue, Monroe, Mich., is said to have plans under way for rebuilding portion of plant recently destroyed by fire, with loss in excess of \$35,000 with equipment.

Public Lighting Commission, 172 East Atwater Street, Detroit, is having plans drawn for extensions in municipal electric lighting plant with installation to include a 20,000-kw. turbo-generating unit, condenser, boilers, stoker, pumping machinery and accessories, to cost about \$550,000. Smith, Hinchman & Grylls, Marquette Building, are architects and engineers.

General Motors Truck Corporation, Flint, Mich., is planning for early removal of its yellow taxi-cab manufacturing division from Chicago to new main plant at Flint, recently completed, where increased capacity will be developed. Production will be concentrated at local works for motor trucks, parlor coaches and taxi-cabs.

Grand Rapids Sash & Door Co., Grand Rapids, Mich., is considering rebuilding portion of millwork plant destroyed by fire May 13, with loss reported at \$100,000 including machinery.

Chevrolet Motor Co., Flint, Mich., is said to be planning early call for bids for new branch plant at Saginaw, Mich., consisting of several two-story units to cost more than \$5,000,000. Albert Kahn, Inc., Marquette Building, Detroit, is architect.

Consumers Power Co., Jackson, Mich., will soon begin work on a one-story addition to steam-operated electric generating plant at Grand Rapids, Mich., 80 x 100 ft., to cost more than \$400,000 with equipment.

Kinsey Motors, Inc., 105 Sheldon Street, S. E., Grand Rapids, Mich., has filed plans for one-story service, repair and garage building, 100 x 170 ft., to cost close to \$90,000 with equipment.

Chrysler Motor Corporation, Highland Park, Detroit, has plans for a new four-story unit, largely for assembling, to cost upward of \$450,000 with machinery. Smith, Hinchman & Grylls, Marquette Building, are architects and engineers.

Accuralite Co., Terrace Street, Muskegon, Mich., manufacturer of piston rings and kindred products, will soon begin

erection of one-story plant, 80 x 200 ft., to cost approximately \$40,000 with equipment.

Fisher Body Corporation, General Motors Building, Detroit, manufacturer of automobile bodies, is reported planning construction of new plywood mill in vicinity of Longview, Wash., where site is being secured, to cost more than \$350,000 with equipment.

Standard Oil Co. of Indiana, Inc., 910 South Michigan Avenue, Chicago, has leased property at Muskegon, Mich., for new oil storage and distributing plant, including pumping facilities for loading tank cars, to cost close to \$100,000 with equipment.

Michigan Clay Products Co., Williamston, Mich., manufacturer of brick, is considering an expansion program to double present capacity, including installation of presses, conveying machinery, power equipment and other apparatus to cost more than \$85,000.

Allis-Chalmers Mfg. Co., Milwaukee, has removed its Grand Rapids, Mich., branch to 310 Building & Loan Building. G. C. Culver is in charge.

## Pacific Coast

SAN FRANCISCO, May 16.

**C**ONTRACT has been let by Magnavox Co., Emeryville, Cal., manufacturer of radio equipment, to H. J. Christensen, Syndicate Building, Oakland, Cal., for one-story addition to cost close to \$25,000 with equipment. B. J. S. Cahill, 357 Twelfth Street, Oakland, is architect.

H. C. Smith Co., Los Angeles, manufacturer of oil well equipment and supplies, has awarded general contract to Union Iron Works for new plant, consisting of main machine unit, one story, 70 x 225 ft.; one-story welding works, 60 x 100 ft.; warehouse and distributing unit, 60 x 125 ft.; office and administration building, 45 x 80 ft., to cost approximately \$100,000 with equipment.

Fred D. Colby, 215 Currier Building, Los Angeles, has filed plans for a one-story battery and electrical equipment repair works, 50 x 120 ft., to cost close to \$20,000 with equipment. J. T. Zeller, Currier Building, is architect.

City Council, Ellensburg, Wash., is considering extensions and improvements in municipal electric light and power plant, including installation of equipment, to cost more than \$35,000.

Binder & Curtis, 35 West San Carlos Street, San Jose, Cal., architects, have plans for two-story automobile service, repair and garage building, to cost \$150,000 with equipment.

Celite Products Co., 1320 South Hope Street, Los Angeles, manufacturer of insulating products, is planning extensions and improvements in plant of National Magnesite Co., Redwood City, Cal., recently secured. Work will consist of new buildings and installation of machinery for mining raw material, refining, etc., to cost approximately \$200,000.

Uttley & Kleindenst, 354 Hobart Street, Oakland, Cal., engineers, have plans for a cold storage and refrigerating plant for company whose name is temporarily withheld, to cost upward of \$400,000 with equipment.

City Water Board, Eugene, Ore., is asking bids until June 5 for construction and equipment for municipal hydro-electric power project, comprising Leaburg unit with power dam, penstocks, tailrace, headworks, etc., one-story power house, 48 x 83 ft., for ultimate output of 210,000 hp.; 30-ton traveling crane switchboard and auxiliary apparatus. Stevens & Koon, Spalding Building, are engineers.

Richfield Oil Co., Seattle, has leased waterfront property and plans early construction of oil storage and distributing plant, to cost close to \$200,000 with equipment.

Royal Crystal Salt Co., Salk Lake City, Utah, care of I. A. Clayton, Jr., 201 Regent Building, an official of Inland Crystal Salt Co., has plans for a new refinery on tract of salt deposits about 12 miles from city, to cost close to \$400,000 with machinery.

Firestone Tire & Rubber Co., Akron, Ohio, has acquired property, 140 x 200 ft., at Phoenix, Ariz., and plans construction of factory branch and distributing plant to cost in excess of \$100,000 with equipment.

Los Angeles Gas & Electric Corporation, Los Angeles, has purchased site at Alhambra, Cal., for new equipment storage and distributing plant, with repair department, to cost \$50,000 with equipment.

Portland Bolt Co., Fourteenth Street, Portland, has plans for a two-story addition, 80 x 85 ft., to cost about \$27,000 with equipment. Edmund T. Bidwell, Corbett Building, is architect.

Winner Tool Co., Puyallup, Wash., is in the market for two No. 3 double Lapointe broaching machines; two No. 1 single or double Lapointe broaching machines; one No. 9 single Lapointe broaching machine; two No. 7 H Becker

Lincoln type millers; one five or six-spindle sensitive high-speed drilling machine  $\frac{1}{2}$ -in. or  $\frac{3}{8}$ -in. capacity.

Pure Iron Culvert & Mfg. Co., Portland, Ore., has been appointed distributor in Oregon and western Washington for wire fence and highway guard products of Page Steel & Wire Co., Bridgeport, Conn. Eugene W. Gibson is manager of Portland company.

Earl Aircraft Corporation, Portland, Ore., is receiving machinery for plant to manufacture an airplane motor designed by Harry W. Earl, president of new company.

Woodbury & Wheeler, 55 Second Street, Portland, Ore., and Cunningham Electric Co., 2123 Pacific Avenue, Tacoma, Wash., have been appointed representatives in their respective districts for Foote Brothers Gear & Machine Co., Chicago.

## Canada

TORONTO, May 21.

**B**OOTH dealers and builders report a good demand for machinery and tools, manufacturers also having a considerable volume of unfilled orders on their books. Sales the past week were somewhat better than those for the first two weeks in May, and business for the month promises to compare favorably with any month so far this year. A small list of machine tools and wood-working equipment has been closed by the local Board of Education for a technical school, and some fair sized inquiries are out for new industrial plants.

Backus Brooks Co., Minneapolis, Minn., through its subsidiary, Great Lakes Paper Co., Ltd., will erect a newsprint paper mill at Fort William, Ont., to have an annual capacity of 100,000 tons, with provision for increasing this to 200,000 tons. First unit of mill will be started within a month.

Robert Mitchell Co., Ltd., Montreal, has purchased local plant of National Bronze Co., Ltd., and will carry on manufacture of architectural bronze, fittings, etc.

Electric light and power plant at St. Jovite, Que., was totally destroyed by floods several days ago, causing loss to plant and equipment of \$30,000.

Public Utilities Commission, Picton, Ont., will proceed with construction and installation of waterworks plant and system to cost \$50,000. New pump house will be erected and auxiliary gas engine and other equipment will be installed.

Suspended-Air-Tires, Ltd., 1089 Bathurst Street, Toronto, will build a factory at Orillia, Ont., one story, 100 x 100 ft.

Eastern Cement Products, Ltd., 111 Princess Street, East St. John, N. B., will start work immediately on erection of a factory. John Flood & Sons have general contract.

Sandwich Foundry Co., 400 Bloomfield Avenue, Sandwich, Ont., has awarded several contracts in connection with erection of a one-story addition to its foundry, to cost \$20,000. New equipment will be purchased.

Foundation Co. of Canada, Ltd., 745 Sherbrooke Street West, Montreal, has the general contract for addition to Three Rivers, Que., paper mill of St. Lawrence Paper Mills, Montreal. Engineer, H. S. Taylor, 1111 Beaver Hall Hill, Montreal. Addition will be one story, reinforced concrete construction.

Ratepayers of Gore Bay, Ont., have authorized expenditure of \$15,000 for erection of an electric light plant.

Canadian Salt Co., Sandwich, Ont., will build addition to its plant to cost \$300,000.

St. Jerome Light & Power Co., St. Peter Street, Quebec, has awarded contract to Ferland & Laliberte, for construction of a hydroelectric power plant at Metabetchouan, Que.

R. T. Gee Co., 173 Dundas Street, London, Ont., has let contract to C. Hubbell, Thamesville, Ont., for erection of a factory at Thamesville, to cost \$32,000. It will consist of four buildings, each 40 x 120 ft.

### Western Canada

W. J. Cunningham, superintendent, Edmonton, Alta., has recommended purchase of \$34,000 worth of new machinery for city power plant. While the machinery proposed will meet present needs, a larger program will have to be considered within two years.

Crow's Nest Pass Coal Co., Fernie, B. C., has started work on a power plant, 35 x 102 ft., at Coal Creek to cost \$25,000. B. Caulfield is engineer.

Bartholomew, Montgomery & Co., Standard Bank Building, Vancouver, B. C., have contract for building hydroelectric power development plant at Whitewater Mines, B. C., to cost \$20,000 for Whitewater Mines, Ltd., Vancouver and Retallack, B. C.

With granting of licenses by Provincial Government of British Columbia permitting use of Nimpkish River for power purposes, Canadian Forest Products Ltd., an organization backed by International Harvester Co. of Chicago will erect a paper mill and power development plant on east coast of Vancouver Island. Plans have been completed for construction of a dam 200 ft. high.

## Foreign

**P**LANS are being arranged by Stewarts & Lloyd of Australia, Ltd., Sydney, for new mill for manufacture of welded steel pipe and tubing under lap-weld process, to cost close to \$4,750,000. Company is branch of English concern of same name, with plants at Birmingham, England, and Glasgow, Scotland.

Standard Oil Co. of New Jersey, Inc., 26 Broadway, New York, is reported planning early construction of new plant in Ruhr district, Germany, for production of glykol, a substitute for glycerin, for which process patents were secured from German Dye Trust several months ago. Initial units are expected to cost more than \$500,000.

Brown Coal Industrial Corporation Zunkunft, Dortmund, Germany, manufacturer of brown coal briquettes, is disposing of bond issue of \$2,000,000 in United States, portion of fund to be used for expansion and improvements. Company also operates power properties, and is controlled by Rhine-Westphalia Electric Power Corporation, with plant and system in Westphalia district.

Corn Products Refining Co., 17 Battery Place, New York, is planning for new refinery at Sao Paulo, Brazil, to cost close to \$1,000,000 with machinery. Similar plant is contemplated in Japan, work to begin early next year.

Officials of State of Hessen and City of Frankfurt, Germany, have organized Hefrag Corporation, to construct and operate a coal distillation plant and power station at Wolfersheim, Wetterau district, utilizing brown coal deposits in that section. Project will include by-products units for tar and tar products, and benzine factory, with coal-preparing works, drying plant and other divisions. Entire enterprise is estimated to cost 10,000,000 m. (about \$2,380,000) with machinery. American Consulate, Frankfurt-on-Main, Germany, Hamilton C. Claiborne, consul, has information regarding project.

Durant Motors, Inc., 250 West Fifty-seventh Street, New York, has purchased property through its president, William C. Durant, now abroad, from Deutsches Werke at Havelhost, suburb of Berlin, Germany, consisting of group of buildings on about six acres. Structures will be remodeled for branch plant and will be ready for service in about 90 days.

## New Trade Publications

**Regenerative Air Preheater.**—Blaw-Knox Co., Pittsburgh. Folder of 6 pages, illustrated, describing a method of holding air at 1500 deg. Fahr. without the use of checkers. Some of the illustrations show applications.

**Reducing Gears, etc.**—Winfield H. Smith, Inc., Springfield, N. Y. Booklet of 16 pages illustrating and describing speed reducers of various types, together with pulleys, pillow blocks, hangers, etc.

## Branch Office Representatives of The Iron Age

### Editorial

Chicago, Otis Bldg.....R. A. Fiske  
Pittsburgh, Park Bldg.....G. F. Tegan  
Cleveland, 1362 Hanna Bldg.....F. L. Prentiss  
Cincinnati, 408 Union Central Bldg.....Burnham Finney  
Boston, Park Square Bldg.....Gerard Fraser  
Washington, 536 Investment Bldg.....L. W. Moffett

### Advertising

Chicago, Otis Bldg.....F. S. Wayne  
Pittsburgh, Park Bldg.....W. B. Robinson  
Cleveland, 1362 Hanna Bldg.....Emerson Findley  
Cincinnati, 408 Union Central Bldg.....Pelce Lewis  
Boston, Park Square Bldg.....H. K. Barr  
Philadelphia, 1402 Widener Bldg.....Charles Lundberg  
Buffalo, 835 Ellicott Sq.....B. L. Herman  
Detroit, 7338 Woodward Ave.....Pelce Lewis  
Hartford, Conn., P. O. Box 81.....D. O. Warren  
New Jersey, Hotel East Orange, East Orange, N. J.,  
W. O. Sweetser  
New York, 239 West Thirty-ninth St.,  
W. O. Sweetser, Chester H. Ober  
San Francisco, 320 Market St.....W. A. Douglass

